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SEPTEMBER 2006

NATIONAL GEOGRAPHIC

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Rising

MANCHURIA'S RUST-TO-RICHES GAMBLE

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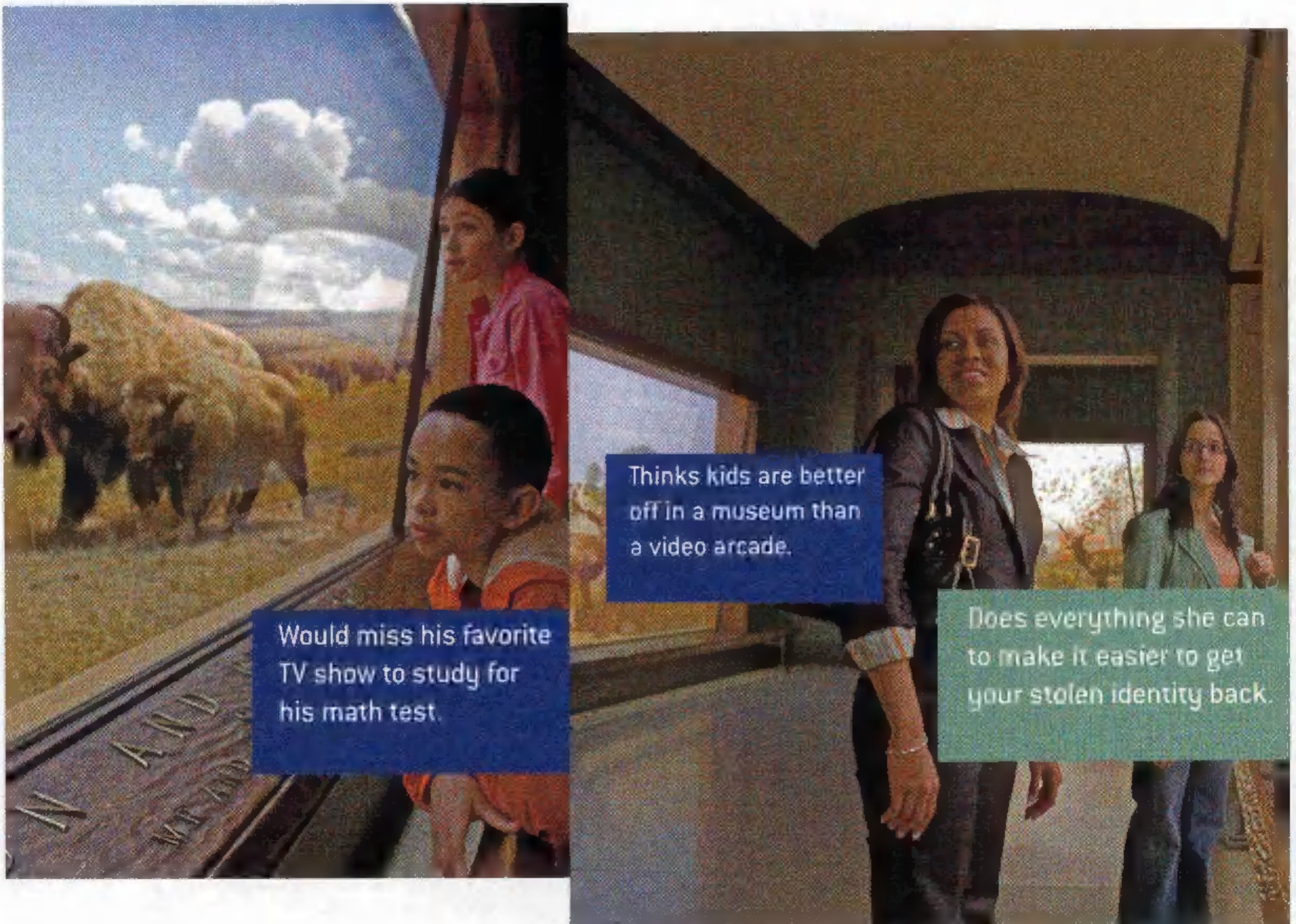
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SEPTEMBER 2006 • VOL. 210 • NO. 3

Two members of a Botswana pride square off in a brief skirmish. For the moment, their favorite prey—a herd of Cape buffalo—is safe. Story on page 110.



BEVERLY JOUBERT

Features

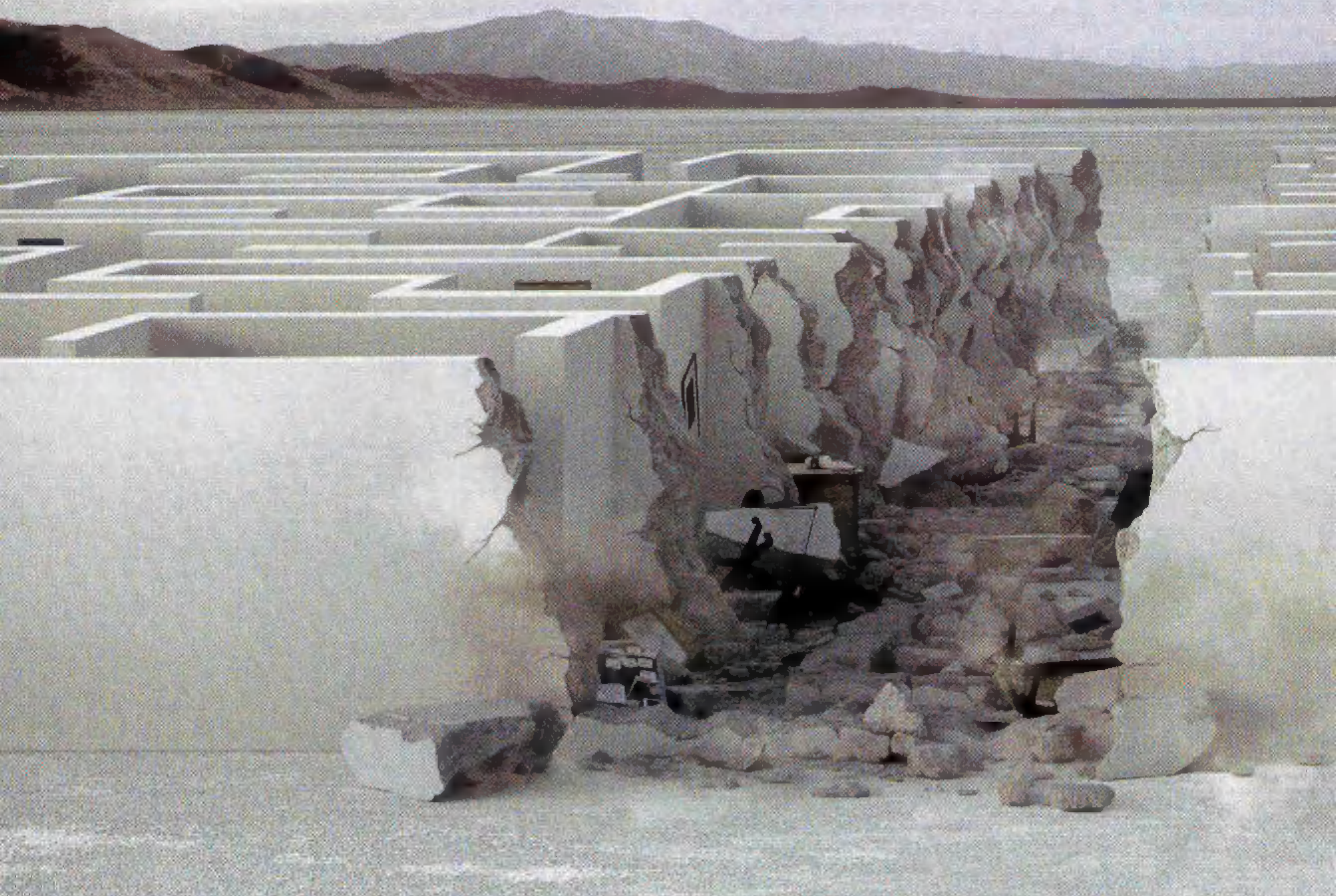
- Manchurian Mandate** 42 China is gearing up to turn its northeastern rust belt, once the centerpiece of Chairman Mao's planned economy, into the country's next engine of growth.
BY BROOK LARMER PHOTOGRAPHS BY FRITZ HOFFMANN
- The Joy of Shoes** 74 Baby booties to orthopedic sandals, we spend most of our waking lives in shoes, and from them we may learn something about our culture, our history, and ourselves.
BY CATHY NEWMAN PHOTOGRAPHS BY MITCHELL FEINBERG
- Raging Danger** 94 On an island off Papua New Guinea, a white-water river vanishes into a limestone cave. Following the torrent underground, a team discovers breathtaking waterfalls and theater-size chambers.
BY NEIL SHEA PHOTOGRAPHS BY STEPHEN L. ALVAREZ
- Killer Pride** 110 Rarely witnessed behavior marks the predator-prey relationship of a pride of lions and a herd of Cape buffalo on a marshy island in Botswana's Okavango Delta.
BY DERECK JOUBERT PHOTOGRAPHS BY BEVERLY JOUBERT
- Life in the Desert** 124 Hottest of North America's deserts, the Sonoran's 100,000 square miles manage to support an incredible array of plants, animals, and landscapes.
BY DOUGLAS H. CHADWICK PHOTOGRAPHS BY GEORGE STEINMETZ

COVER The statue of a "model worker" overlooks Iron Man Square and soaring construction in Daqing, China. **PHOTO BY FRITZ HOFFMANN**

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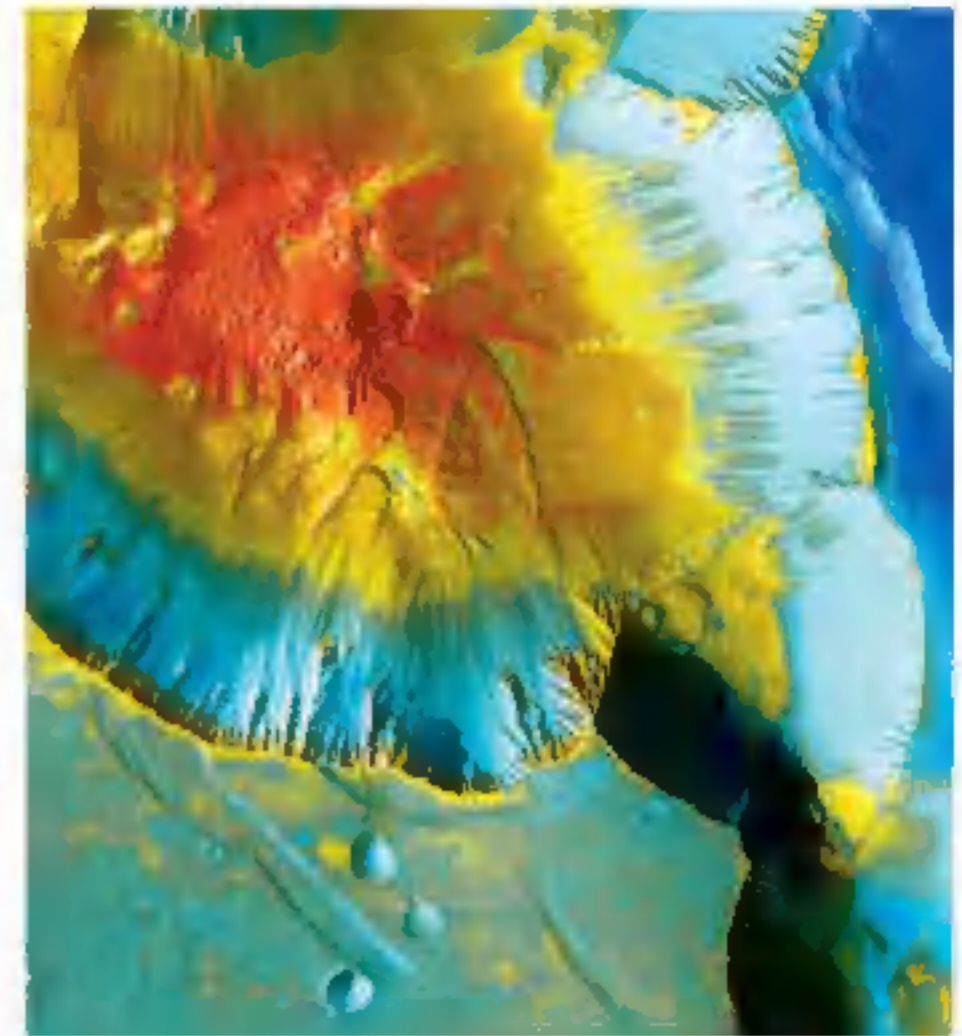
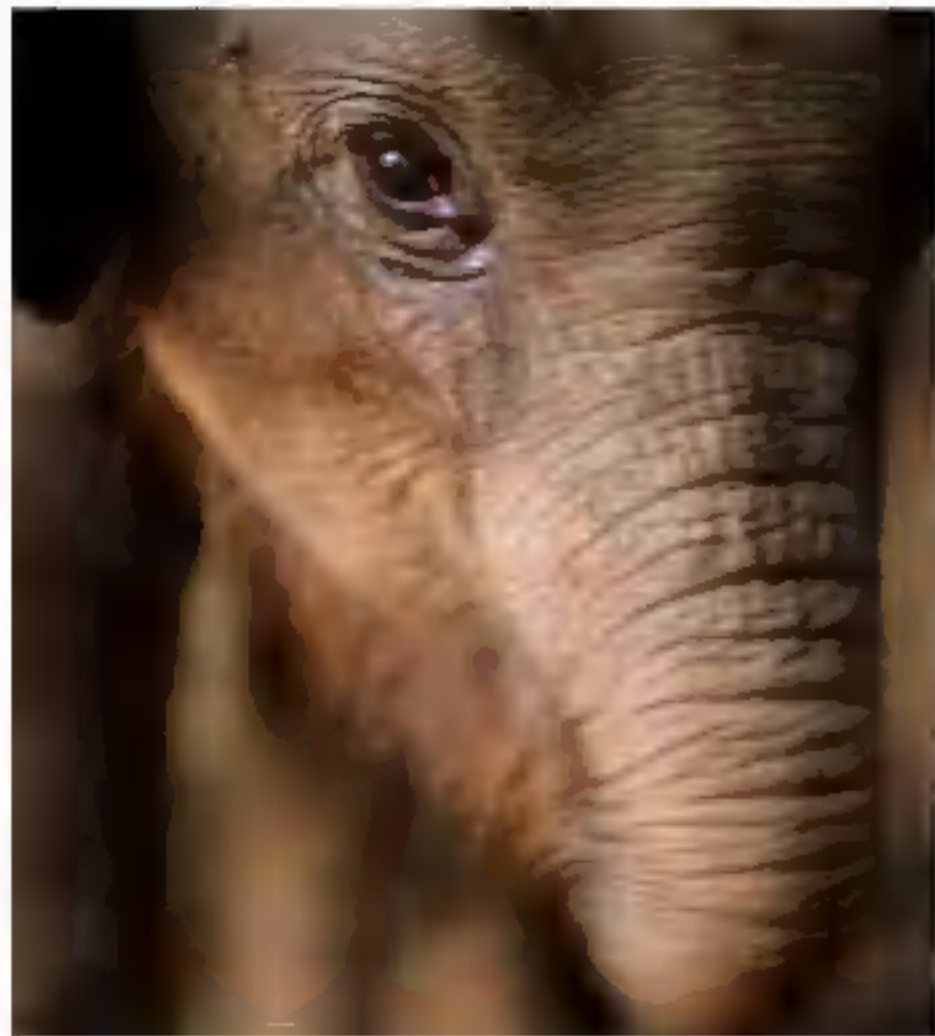
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River Caves

Follow photographer Stephen Alvarez underground and explore waterfalls, lakes, and passages beneath a tropical rain forest.

China's Gamble

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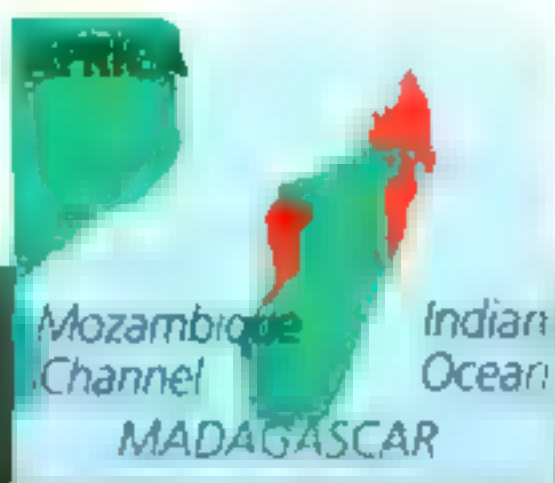
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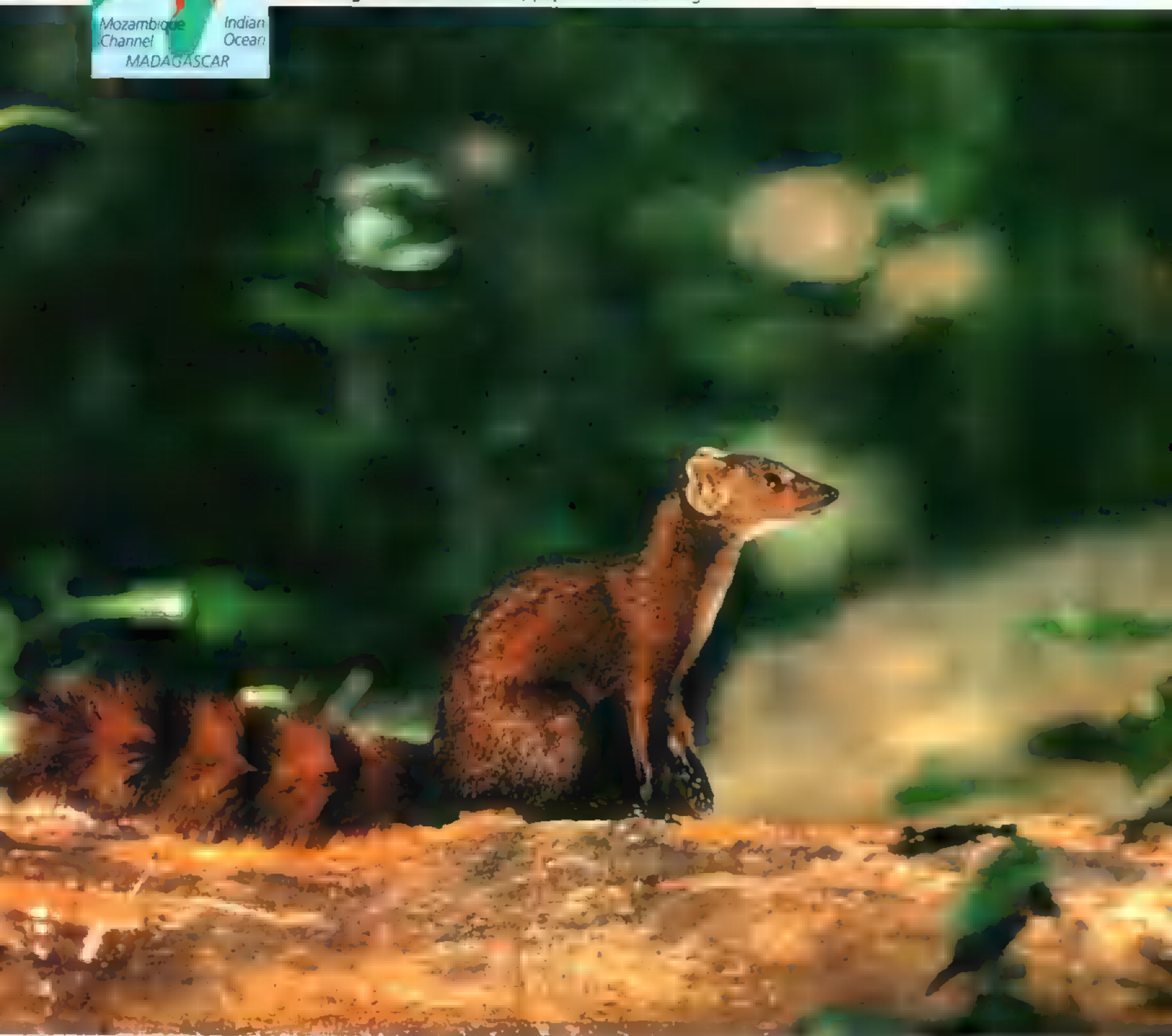


Malagasy Ring-tailed Mongoose (*Galidia elegans*)

Size: Head and body length, 32 - 38 cm; tail, 27 - 32 cm

Weight: 700 - 900 g ■ **Habitat:** Undisturbed forests in northeast and western Madagascar

Surviving number: Unknown; populations declining



Photographed by Pete Oxford

WILDLIFE AS CANON SEES IT

To prey or to play—that is the question. The Malagasy ring-tailed mongoose does plenty of both. Though rather petite by mongoose standards, it is a deft hunter, taking advantage of keen senses and agility to prey on everything from reptiles and small mammals to birds and their eggs. When not out hunting, it spends quality time playing with the other members of its small, tight-knit group. Based around a central pair, these groups sleep together in burrows that they

dig themselves or find in tree hollows. But they can hardly rest easy, threatened by habitat loss and degradation on one side and competition from feral dogs and cats on the other.

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Prefontaine's custom-made shoe weighed less than three ounces.

Every shoe tells a story, according to Cathy Newman's article in this issue. The ones I wear as I write this column tell a tale that begins with a model crafted of the softest glove leather (above). It was made in 1969 for Steve Prefontaine, a track phenomenon who grew up in Coos Bay, Oregon, 100 miles northwest of my hometown. The man who built this shoe for Prefontaine, coach Bill Bowerman, wrote him a note that said, "If you come to the University of Oregon, you can be the best distance runner in the world."

He did—and he was. I can still recall photographing him in the final turn at Oregon's Hayward Field as the crowd screamed, "Pre! Pre!" He'd fallen behind in the last lap but kicked in to win, setting an American record in the three-mile event. Prefontaine was wearing new shoes based on a design by Bowerman, a man who once used his wife's waffle iron to mold soles for his track team. It's said that the shoes Prefontaine wore that day made a company: Nike.

Prefontaine died in an automobile accident on May 30, 1975. I was standing in the newsroom of the *Topeka Capital-Journal* when I heard the news, and my heart broke. Something he once said still stays with me: "When people ask me why I run, I tell them a lot of people run races to see who's fastest. I run races to see who has the most guts."



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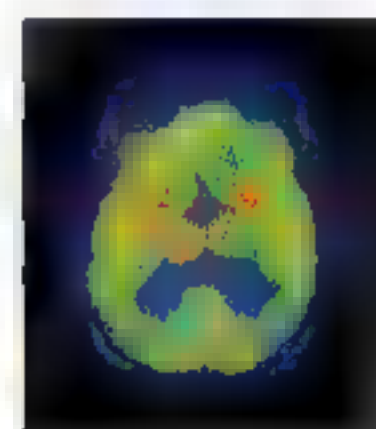


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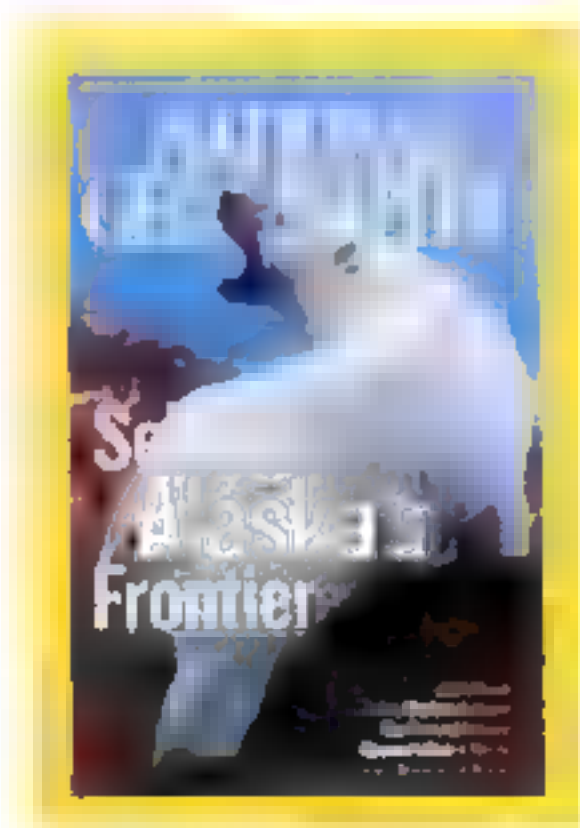


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LETTERS



May 2006 *"The Judas Gospel" rode a crest of media attention worldwide, but some letters criticized its timing, before The Da Vinci Code's release, as opportunistic. Readers also debated the merits of drilling for oil in Alaska. While many called for it to stop, others felt like reader Pete Hanlin, who wrote, "I would be hard-pressed to come up with a better location."*

➤ Comment on September stories at ngm.com.

The Judas Gospel

No reputable scholar believes the Gospel of Judas can tell us what happened circa A.D. 30. Prior to NGS's antics around this interesting but hardly revolutionary manuscript, I had believed the Society existed to bring knowledge to a wider public. Its mission instead seems to be pandering for cash.

JAMES TURNER
Notre Dame, Indiana

We live in a global community divided by religious fundamentalism. It is an indication of the GEOGRAPHIC's dedication to the essence of journalism to feature such a controversial discovery.

JASON TUCKER
Winnipeg, Manitoba

I enjoyed this article, but I am astonished that there seems to be a general opinion that every ancient written document found

is truth. Through the ages, many people have put pen to paper to share their views. I do not question the authenticity of the time period of this priceless ancient document, but I certainly hope that thousands of years from now, when pages of books are found, every word will not be taken as fact about our present society.

KAY ADAMS
Moffat, Colorado

I like to think of NATIONAL GEOGRAPHIC as a science teaching organ, but your article sounded like news with a typical bias toward sensationalism. You told us next to nothing about the truly exciting science of the interpretation of ancient texts. Christian and Jewish scholars have been using scientific

Now it's dead.



methods to study sacred writings, both biblical and non-biblical, for over a century and achieving agreed-upon results.

JACK HARTJES
St. Cloud, Minnesota

I take great exception to the comment "As Christianity distanced itself from its origins as a Jewish sect, Christian thinkers found it increasingly convenient to blame the Jews as a people for the arrest and execution of Christ, and to cast Judas as the archetypal Jew." I was raised in a Christian home. In my church I was taught to respect Jewish people as God's chosen. Without roots in Judaism there would be no Christianity.

CHARMAINE VAN DEN EYNDEN
Pictou, Nova Scotia

Fall of the Wild

Your story laid bare the mythology proffered by the Bush Administration that the Arctic National Wildlife Refuge is a frozen wasteland, more appropriate for oil production than for wilderness, wildlife, and the cultural legacy of the Gwich'in people. Your words and images were testament to the moral bankruptcy of drilling what is left of the wild Arctic.

JAY THOMAS WATSON
Sonoma, California

As Joel Bourne notes, the majority of land in the North Slope "belongs to you and me." As a member of that group, I would be hard-pressed to come up with a better location for oil deposits than the North Slope of Alaska—

a location that doesn't see the sun for weeks of the year and has a population of less than 8,000, with potentially enormous oil fields.

PETE HANLIN
Hickory Creek, Texas

No amount of rhetoric, money, or politics can justify what is being contemplated and what has already been done. If the same amount of resources

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LETTERS

was spent campaigning to change the way we consume energy, you would see real progress. Not only would we spare what pristine wilderness we have left, but by being more self-sufficient, with a variety of energy sources readily available to us, we would also be independent of foreign influence in shaping our vision of a strong and healthy world.

JEANNIE PARKER
Montrose, New York

Your pictures are beautiful and tell a worthy story. I lived in Texas and now live in California. As a Texan we produced a significant part of the nation's oil and gas. Yet you do not hear the outcry that oil has ruined the local Texas environment. The advantage of producing oil and gas in Alaska is solid. It produces worthwhile jobs and income to the Alaskans, and lessens the dependence on foreign oil.

CHARLES HARPER
La Habra, California

As a 37-year Alaska resident I've been distressed by our congressional delegation's attempts to portray ANWR as barren and devoid of anything worthwhile, when quite the

Corrections, Clarifications

Allergy Misery (May 2006)

Cortisol is secreted by the adrenal gland, not the pituitary gland, as stated on page 127. The pituitary gland starts the process by sending a signal to the adrenal gland to release the cortisol.

Inside Geographic (May 2006)

The roller coaster pictured on page 170 is not Dragon Khan in Salou, Spain. It is the Tizona coaster at the Terra Mítica amusement park in Benidorm, Spain.

opposite is obvious. Your article demonstrates both the error in their claims as well as the depths to which they will stoop in trying to sell Alaska to the oil industry. The spills, the demonstrated inability to deal with them, and the incredible fragility of an environment stressed by global warming argue against drilling.

ART GREENWALT
Fairbanks, Alaska

Your story included a factual error about Alaska's North Slope oil development when it claimed, "There are no plans to clean up the place when the oil and gas are gone." On the contrary, Alaska's oil permits and leases include specific stringent rehabilitation standards. They require operators of economically played-out fields to remove all improvements for development and to rehabilitate the land to the satisfaction of the commissioner of the Alaska Department of Natural Resources.

MICHAEL L. MENGE
Commissioner
Department of Natural Resources
Juneau, Alaska

Writer Joel Bourne replies: Under current state leases, oil companies have the right—not the obligation—to remove their equipment at the end of the lease. The state has the option of forcing them to remove any improvements and rehabilitate the land, or turn such improvements—roads, pads, etc.—over to the state. Any rehabilitated lands must simply meet the "satisfaction of the state." Despite repeated requests, Commissioner Menge's office was unable to produce any "specific stringent rehabilitation standards."



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LETTERS

Allergy Misery

Many thanks for providing such an informative article about the rise of allergies. As a parent of a son who is allergic to many foods, every day is a challenge. Simple activities such as birthday parties, snack time at school, and food shopping become a conscious, constant effort to ensure the avoidance of the allergen. One of the biggest obstacles I have encountered is the lack of education and misinformation people have about allergies and their ability to be life threatening. Through your article, you have helped empower allergy sufferers and also helped raise awareness.

MELISSA CARLINO-DIAZ
Flushing, New York

I am a veterinarian with 26 years experience. In the course of my career, I have seen a large increase in allergies in dogs and cats. For many of my patients, their acute sense of smell is their downfall. We are bombarded with ads for "fresh scents" to make our homes pleasant smelling. To get us to notice, the companies make the scent very strong. Most animals, however, live in a world of minute scents that guide their daily activities.

DONALD K. ALLEN
Youngstown, Ohio

I found your article on allergies a source of hope. Articles like this further illuminate the connection between all we do. We can no longer deny the

ramifications of polluting our environment, and we can no longer view humans as completely removed from the environment in which we live.

ALLISON STEELE
Fort Myers, Florida

Prince Charles's Backyard

Your article revealed Prince Charles to be an intelligent man of vision. If only public servants around the world shared in the belief that civilization, beauty, and sustainable agriculture can co-exist, it would truly be a wonderful world for future generations.

TRACY WRIGHT
Shelton, Washington

I am glad to read an article about Prince Charles that shows his concern for preserving



essential₂w

and fostering the community as well as the need for a harmonious relationship with the environment. He has often been rewarded by having his work ignored and his personal life sensationalized by people who know nothing about who he is and what he gives.

BRUCE C. JOHNSON
Grand Rapids, Michigan

Voices: Edward O. Wilson

Thank you for featuring Wilson as the subject of Voices. I can't begin to describe how much his writings touched me as a budding student. Reading *The Future of Life* in my junior year of high school gave me, a Kansas girl fascinated with all aspects of science, the boost I needed

to follow my dream of studying evolutionary biology.

REA MANDERINO
Chicago, Illinois

Family of Man: Students

While I knew part of my husband's family had emigrated to Australia, it was an unexpected pleasure to see a "cousin" on your Family of Man page. Claire Borthwick and my husband can trace their lines back to the same Scottish laird. How's that for a true extension of the Family of Man? May Claire's Olympic dreams come true.

DIANA BORTHWICK
Laramie, Wyoming

Photo Journal

One of the most beautiful things your magazine does is connect us to a world much

larger than the one we live in. I was moved by the picture and short article about Farhad, who was a teacher and now works in a salt marsh to support his family. I want to help Farhad. Is there a way?

SYLVIE STEWART
Dayton, Ohio

From photographer Reza: As a refugee, Farhad has no fixed address. But you may help other refugees. The way I found to help these Azerbaijani refugees was to build a school. After that I put my humanitarian energy into creating a foundation that aims to educate children, whose fathers work for days for their survival just like Farhad.

To learn more about Reza's efforts and how to help, go to ainaworld.org.

alkingaway

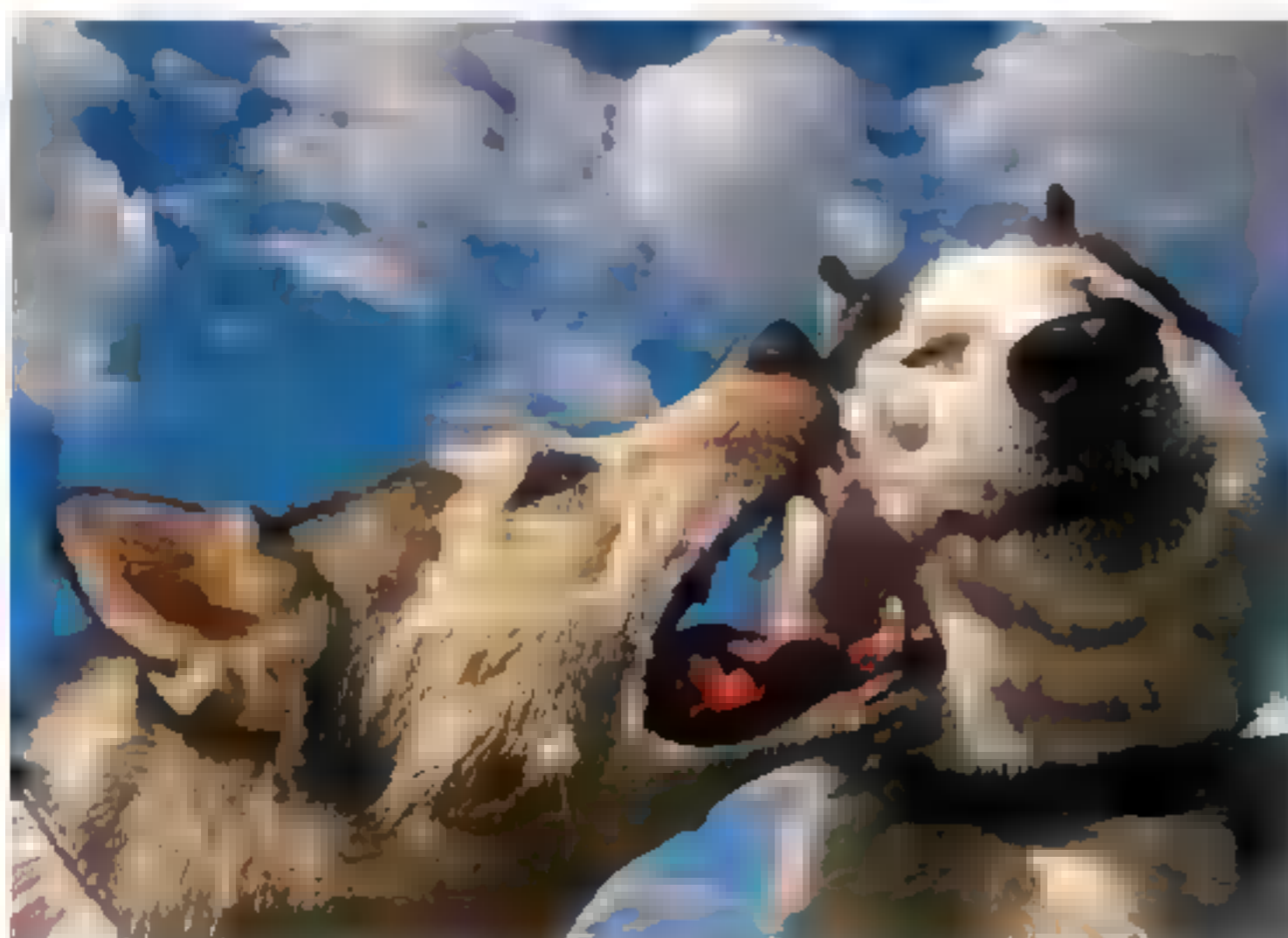
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Pets These pictures on the theme of “Pets” were selected from reader photos posted to the Your Shot website. Continue the conversation with our editors—and with NATIONAL GEOGRAPHIC readers—by submitting your own images on the new theme of “Heat.” Photographs selected will be published in the December 2006 issue. For guidelines, a submission form, and more information, go to ngm.com/yourshot.

Agnieszka Łuczakowska Katowice, Poland

“People buy huskies because they’re beautiful, but they need a lot of activity,” says Agnieszka Łuczakowska, who snapped Paco and Aqua after a dogsled race in Dziergowice, Poland.



Bradley Thompson Zionsville, Indiana

The Thompson family acquired Buster and Ned—two dumpy tree frogs—when kids’ allergies precluded fluffier pets. “We’re always asked if they’re fake,” says mom Betty Thompson. “They’re real!”



Piow Kan Pang Penang, Malaysia

A harmonica signals breakfast for two appreciative pigs in a village in Fujian, China. “When they heard the music, they came near and stood up,” photographer Piow Kan Pang recalls.



Genevieve Shiffrar San Francisco, California

“Some pets are ephemeral,” notes Genevieve Shiffrar. At a roundup on a ranch in Nipomo, California, she caught this boy snaring lizard livestock with blades of grass.

**LIFE
TAKES
PROOF**



**LIFE
TAKES
VISA**



Wentzel and his ambulance—which served as darkroom and sleeping quarters—stop on the road to Kashmir.

Kurt Wentzel's career as a NATIONAL GEOGRAPHIC photographer spanned five decades. He died at the age of 91 in May. This text is excerpted from the eulogy given by the Society's Executive Vice President—and Kurt's friend—Terry Adamson.

"Do India." Those were NATIONAL GEOGRAPHIC's instructions to Volkmar "Kurt" Wentzel in the late 1940s. For two years and over 40,000 miles, the intrepid photographer traversed the subcontinent in an old converted ambulance that he'd bought in Calcutta for \$600—plus a membership to the National Geographic Society.

The response back at the magazine to this purchase? In Kurt's own words: "I took the ambulance to a village outside of Delhi . . . and photographed it with a cow in the foreground and some Indian children climbing on it, and I sent that to headquarters. I got a letter back from the business side, somewhat sarcastic, saying, 'Dear Mr. Wentzel, I'd like to bring to your attention that a letter of credit is for drawing small sums. We would like to know why you withdrew this large sum.'

"I was absolutely shattered. I thought, I put all the eggs in one basket, but now they're unhappy. I was really down in the dumps when a telegram arrived—which I still have—signed G. H. G. [Gilbert H. Grosvenor, President of the Society and Editor of the GEOGRAPHIC]: 'Congratulations, acquisition of National Geographic Photo Survey Car. Bon voyage.'"

Kurt was on his way.

Photo Gallery See more photos by Kurt Wentzel at ngm.com/0609.

4 rolling hills won't keep you from
taking the road less traveled.



You don't have to plan around your arthritis pain.

Is it the climb? The gently sloping trail? Or getting back up from a rest? If you have osteoarthritis, it colors everything you do. But you shouldn't have to miss out on the important things. Ask your doctor about prescription CELEBREX. It was designed to target the source of your pain, stiffness, and inflammation.

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CELEBREX is one of the most studied arthritis medicines on the market. But you should know that CELEBREX, like all medicines, has both risks and benefits. It's important to talk to your doctor about treatment options to find out which one is right for you. Your doctor may also recommend other kinds of treatments.

Important Information: CELEBREX, like all prescription NSAIDs, may increase the chance of a heart attack or stroke that can lead to death. It should not be used right before or after certain heart surgeries. Serious skin reactions or stomach and intestine problems such as bleeding and ulcers can occur without warning and may cause death.

Patients taking aspirin and the elderly are at increased risk for stomach bleeding and ulcers.

Tell your doctor if you:

- Are pregnant
- Have a history of ulcers or bleeding in the stomach or intestines
- Have high blood pressure or heart failure
- Have kidney or liver problems

People with aspirin-sensitive asthma or allergic reactions due to aspirin or other arthritis medicines or certain drugs called sulfonamides should not take CELEBREX.

Prescription CELEBREX should be used exactly as prescribed at the lowest dose possible and for the shortest time needed.

For more information, call 1-888-CELEBREX (1-888-235-3273) or visit www.CELEBREX.com

Please see important information about CELEBREX and other NSAIDs on next page.

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200 mg

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Medication Guide

for Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

(See the end of this Medication Guide for a list of prescription NSAID medicines.)

What is the most important information I should know about medicines called Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?

NSAID medicines may increase the chance of a heart attack or stroke that can lead to death.

This chance increases:

- with longer use of NSAID medicines
- in people who have heart disease

NSAID medicines should not be used right before or after a heart surgery called a "coronary artery bypass graft (CABG)."

NSAID medicines can cause ulcers and bleeding in the stomach and intestines at any time during treatment. Ulcers and bleeding:

- can happen without warning symptoms
- may cause death

The chance of a person getting an ulcer or bleeding increases with:

- taking medicines called "corticosteroids" and "anticoagulants"
- longer use
- smoking
- drinking alcohol
- older age
- having poor health

NSAID medicines should only be used:

- exactly as prescribed
- at the lowest dose possible for your treatment
- for the shortest time needed

What are Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?

NSAID medicines are used to treat pain and redness, swelling, and heat (inflammation) from medical conditions such as:

- different types of arthritis
- menstrual cramps and other types of short-term pain

Who should take a Non-Steroidal Anti-Inflammatory Drug (NSAID)?

Do not take an NSAID medicine:

- if you had an asthma attack, hives, or other allergic reaction with aspirin or any other NSAID medicine
- for pain right before or after heart bypass surgery

Tell your healthcare provider:

- about all of your medical conditions.
- about all of the medicines you take. NSAIDs and some other medicines can interact with each other and cause serious side effects. **Keep a list of your medicines to show to your health care provider and pharmacist.**
- if you are pregnant. **NSAID medicines should not be used by pregnant women late in their pregnancy.**
- if you are breastfeeding. **Talk to your doctor.**

What are the possible side effects of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?

Serious side effects include:

- heart attack
- stroke
- high blood pressure
- heart failure from body swelling (fluid retention)
- kidney problems including kidney failure
- bleeding and ulcers in the stomach and intestine
- low red blood cells (anemia)
- life-threatening skin reactions
- life-threatening allergic reactions
- liver problems including liver failure
- asthma attacks in people who have asthma

Other side effects include:

- stomach pain
- constipation
- diarrhea
- gas
- heartburn
- nausea
- vomiting
- dizziness

Get emergency help right away if you have any of the following symptoms:

- shortness of breath or trouble breathing
- chest pain
- weakness in one part or side of your body
- slurred speech
- swelling of the face or throat

Stop your NSAID medicine and call your healthcare provider right away if you have any of the following symptoms:

- nausea
- more tired or weaker than usual
- itching
- your skin or eyes look yellow
- stomach pain
- flu-like symptoms
- vomit blood
- there is blood in your bowel movement or it is black and sticky like tar
- skin rash or blisters with fever
- unusual weight gain
- swelling of the arms and legs, hands and feet

These are not all the side effects with NSAID medicines. Talk to your healthcare provider or pharmacist for more information about NSAID medicines.

Other information about Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

• Aspirin is an NSAID medicine but it does not increase the chance of a heart attack. Aspirin can cause bleeding in the brain, stomach, and intestines. Aspirin can also cause ulcers in the stomach and intestines.

• Some of these NSAID medicines are sold in lower doses without a prescription (over-the-counter). Talk to your healthcare provider before using over-the-counter NSAIDs for more than 10 days.

NSAID medicines that need a prescription

Generic Name	Tradename
Celecoxib	Celebrex
Diclofenac	Cataflam, Voltaren, Arthrotec (combined with misoprostol)
Diflunisal	Dolobid
Etodolac	Lodine, Lodine XL
Fenoprofen	Nalfon, Nalfon 200
Flurbiprofen	Ansaid
Ibuprofen	Motrin, Tab-Profen, Vicoprofen (combined with hydrocodone), Combunox (combined with oxycodone)
Indomethacin	Indocin, Indocin SR, Indo-Lemmon, Indomethagan
Ketoprofen	Oruvail
Ketorolac	Toradol
Mefenamic Acid	Ponstel
Meloxicam	Mobic
Nabumetone	Relafen
Naproxen	Naprosyn, Anaprox, Anaprox DS, EC-Naproxyn, Naprelan, Naprapac (copackaged with lansoprazole)
Oxaprozin	Daypro
Piroxicam	Feldene
Sulindac	Clinoril
Tolmetin	Tolectin, Tolectin DS, Tolectin 600

This Medication Guide has been approved by the U.S. Food and Drug Administration.

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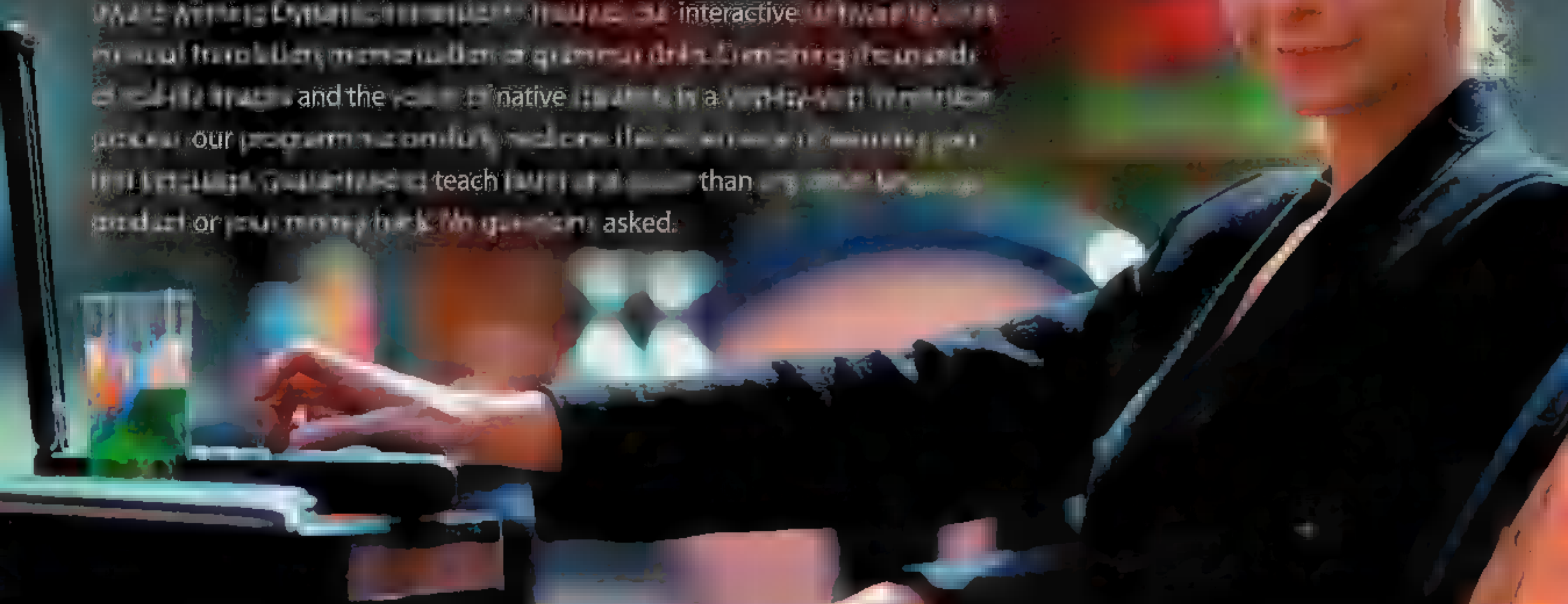


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VISIONS OF EARTH



Kasanka National Park, Zambia Dawn lights the wings of straw-colored fruit bats heading home from a night's foraging. Each November, some eight million of the animals return to the same square mile of swampy forest to roost.

PHOTO: KIERAN DODDS



Jilin Province, China Pink-smocked workers move the meat along at the Deda poultry plant in Dehui. Hundreds of thousands of chickens are processed here each day for domestic consumption and export.





Gombe National Park, Tanzania A termite swarm looks like candy on the wing to five-year-old Goldi, who gobbles as many as she can grab. She is one of about a hundred wild chimpanzees at the preserve.

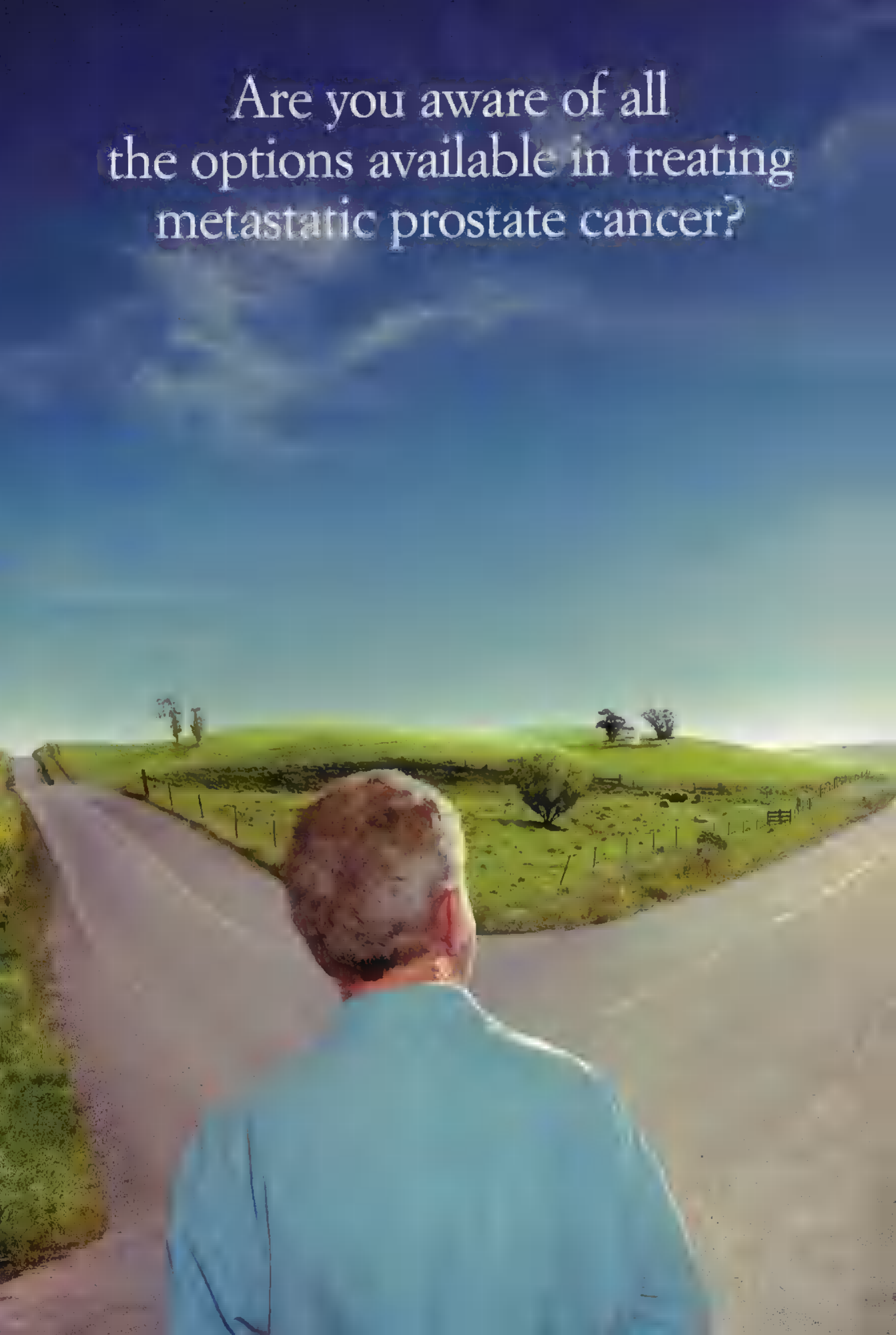


Decorate your desktop with Visions of Earth images in Fun Stuff at ngm.com/0609.

PHOTO: KRISTIN MOSHER



Are you aware of all
the options available in treating
metastatic prostate cancer?



Chemotherapy is now an option that can help extend survival in metastatic prostate cancer.

The FDA approved Taxotere[®] in combination with prednisone as the first and only chemotherapy regimen that may help some prostate cancer patients live longer (up to 2.5 months over another chemotherapy tested) when their cancer has spread and no longer responds to hormone therapy.

How does Taxotere[®] work in prostate cancer?

Cancer treatment has advanced so that aggressive treatments like Taxotere[®] can be used to treat certain types of prostate cancer. Taxotere[®] attacks the structure of cells, including prostate cancer cells, when cancer has spread beyond the prostate.

Is chemotherapy right for me?

If you are interested in learning more about the latest advancement in chemotherapy to treat metastatic prostate cancer that no longer responds to hormone therapy, make sure to include a medical oncologist as part of your healthcare team. Including the perspective of a medical oncologist, along with that of your urologist and radiation oncologist, will help ensure that you are aware of all your treatment options. Options that until now, you never thought you had. To learn if Taxotere[®] is right for you, ask your doctor. For more information visit www.taxotere.com or call 1-800-618-7148.

Important safety information.

WARNING: Taxotere[®] treatment can cause serious, physically limiting, and potentially life-threatening side effects, such as infection, low blood-cell counts, allergic reaction, and retention of excess fluid (edema).

Taxotere[®] should not be given to patients with low white-blood-cell counts, abnormal liver function, or a history of allergic reactions to Taxotere[®] or any of the ingredients in Taxotere[®].

Before each Taxotere[®] treatment, all patients treated with Taxotere[®] must receive another medicine called dexamethasone. This drug can help reduce the risk of fluid retention (edema) and allergic reactions.

Taxotere[®] should be administered only under the supervision of a qualified physician experienced in the use of anticancer treatments. Appropriate management of complications is possible only when adequate diagnostic and treatment facilities are readily available.

The most common severe side effects are low white-blood-cell count, anemia, fatigue, diarrhea, and mouth and throat irritation. Low white-blood-cell count can lead to life-threatening infections. The earliest sign of infection may be fever, so **tell your doctor right away if you have a fever.**

Other common side effects from Taxotere[®] include nausea, vomiting, hair loss, rash, infusion-site reactions, odd sensations (such as numbness, tingling, or burning) or weakness in the hands and feet, nail changes, muscle and/or bone pain, or excessive tearing.

Before receiving Taxotere[®], tell your doctor if

- You have any allergies
- You are taking any other medicines—including nonprescription (over-the-counter) drugs, vitamins, and dietary or herbal supplements

When taking Taxotere[®], contact your doctor if

- You have symptoms of an allergic reaction (warm sensation, tightness in your chest, itching/hives, or shortness of breath)
- You experience any other side effects

Please see adjacent page for patient information leaflet for detailed information about these side effects, and talk to your doctor about any questions you may have.

 **TAXOTERE[®]**
(docetaxel)
Injection Concentrate

PATIENT INFORMATION LEAFLET
Detach and give to Patient

TAXOTERE®
(docetaxel)
Injection Concentrate

Rev. May 2006

PATIENT INFORMATION LEAFLET

Questions and Answers About Taxotere® Injection Concentrate

(generic name = docetaxel)

(pronounced as TAX-O-TEER)

What is Taxotere?

Taxotere is a medication to treat breast cancer, non-small cell lung cancer, prostate cancer and stomach cancer. It has severe side effects in some patients. This leaflet is designed to help you understand how to use Taxotere and avoid its side effects to the fullest extent possible. The more you understand your treatment, the better you will be able to participate in your care. If you have questions or concerns, be sure to ask your doctor or nurse. They are always your best source of information about your condition and treatment.

What is the most important information about Taxotere?

- Since this drug, like many other cancer drugs, affects your blood cells, your doctor will ask for routine blood tests. These will include regular checks of your white blood cell counts. People with low blood counts can develop life-threatening infections. The earliest sign of infection may be fever, so if you experience a fever, tell your doctor right away.
- Occasionally, serious allergic reactions have occurred with this medicine. If you have any allergies, tell your doctor before receiving this medicine.
- A small number of people who take Taxotere have severe fluid retention, which can be life-threatening. To help avoid this problem, you must take another medication such as dexamethasone (DEKSA-A-METH-A-SONE) prior to each Taxotere treatment. You must follow the schedule and take the exact dose of dexamethasone prescribed (see schedule at end of brochure). If you forget to take a dose or do not take it on schedule you must tell the doctor or nurse prior to your Taxotere treatment.
- If you are using any other medicines, tell your doctor before receiving your infusions of Taxotere.

How does Taxotere work?

Taxotere works by attacking cancer cells in your body. Different cancer medications attack cancer cells in different ways.

Here's how Taxotere works: Every cell in your body contains a supporting structure (like a skeleton). Damage to this "skeleton" can stop cell growth or reproduction. Taxotere makes the "skeleton" in some cancer cells very stiff, so that the cells can no longer grow.

How will I receive Taxotere?

Taxotere is given by an infusion directly into your vein. Your treatment will take about 1 hour. Generally, people receive Taxotere every 3 weeks. The amount of Taxotere and the frequency of your infusions will be determined by your doctor.

As part of your treatment, to reduce side effects your doctor will prescribe another medicine called dexamethasone. Your doctor will tell you how and when to take this medicine. It is important that you take the dexamethasone on the schedule set by your doctor. If you forget to take your medication, or do not take it on schedule, make sure to tell your doctor or nurse before you receive your Taxotere treatment. **Included with this information leaflet is a chart to help you remember when to take your dexamethasone.**

What should be avoided while receiving Taxotere?

Taxotere can interact with other medicines. Use only medicines that are prescribed for you by your doctor and be sure to tell your doctor about the medicines that you use, including nonprescription drugs.

What are the possible side effects of Taxotere?

Low Blood Cell Count – Many cancer medications, including Taxotere, can cause a temporary drop in the number of white blood cells. These cells help protect your body from infection. Your doctor will routinely check your blood count and tell you if it is too low. Although most people receiving Taxotere do not have an infection even if they have a low white blood cell count, the risk of infection is increased.

Fever is often one of the most common and earliest signs of infection. Your doctor will recommend that you take your temperature frequently, especially during the days after treatment with Taxotere. If you have a fever, tell your doctor or nurse immediately.

Allergic Reactions – This type of reaction, which occurs during the infusion of Taxotere, is infrequent. If you feel a warm sensation, a tightness in your chest, or itching during or shortly after your treatment, tell your doctor or nurse immediately.

Fluid Retention – This means that your body is holding extra water. If this fluid retention is in the chest or around the heart it can be life-threatening. If you notice swelling in the feet and legs or a slight weight gain, this may be the first warning sign. Fluid retention usually does not start immediately; but, if it occurs, it may start around your 5th treatment. Generally, fluid retention will go away within weeks or months after your treatments are completed.

Dexamethasone tablets may protect patients from significant fluid retention. It is important that you take this medicine on schedule. If you have not taken dexamethasone on schedule, you must tell your doctor or nurse before receiving your next Taxotere treatment.

Gastrointestinal – Diarrhea has been associated with TAXOTERE use and can be severe in some patients. Nausea and/or vomiting are common in patients receiving TAXOTERE. Severe inflammation of the bowel can also occur in some patients and may be life threatening.

Hair Loss – Loss of hair occurs in most patients taking Taxotere (including the hair on your head, underarm hair, pubic hair, eyebrows, and eyelashes). Hair loss will begin after the first few treatments and varies from patient to patient. Once you have completed your treatments, hair generally grows back.

Your doctor or nurse can refer you to a store that carries wigs, hairpieces, and turbans for patients with cancer.

Fatigue – A number of patients (about 10%) receiving Taxotere feel very tired following their treatments. If you feel tired or weak, allow yourself extra rest before your next treatment. If it is bothersome or lasts for longer than 1 week, inform your doctor or nurse.

Muscle Pain – This happens about 20% of the time, but is rarely severe. You may feel pain in your muscles or joints. Tell your doctor or nurse if this happens. They may suggest ways to make you more comfortable.

Rash – This side effect occurs commonly but is severe in about 5%. You may develop a rash that looks like a blotchy, hive-like reaction. This usually occurs on the hands and feet but may also appear on the arms, face, or body. Generally, it will appear between treatments and will go away before the next treatment. Inform your doctor or nurse if you experience a rash. They can help you avoid discomfort.

Odd Sensations – About half of patients getting Taxotere will feel numbness, tingling, or burning sensations in their hands and feet. If you do experience this, tell your doctor or nurse. Generally, these go away within a few weeks or months after your treatments are completed. About 14% of patients may also develop weakness in their hands and feet.

Nail Changes – Color changes to your fingernails or toenails may occur while taking Taxotere. In extreme, but rare, cases nails may fall off. After you have finished Taxotere treatments, your nails will generally grow back.

Eye Changes – Excessive tearing, which can be related to conjunctivitis or blockage of the tear ducts, may occur.

If you are interested in learning more about this drug, ask your doctor for a copy of the package insert.

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Bridgewater, NJ 08807

Country of Origin: United Kingdom

Rev. May 2006

TAX-MAY06-PIL-Ab

Every three-week injection of TAXOTERE for breast, non-small cell lung and stomach cancers
Take dexamethasone tablets, 8 mg twice daily.

Dexamethasone dosing:

Day 1	Date: _____	Time: _____ AM _____ PM
Day 2	Date: _____	Time: _____ AM _____ PM

(Taxotere Treatment Day)

Day 3	Date: _____	Time: _____ AM _____ PM
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Every three-week injection of TAXOTERE for prostate cancer
Take dexamethasone 1 mg, at 12 hours, 3 hours and 1 hour before TAXOTERE infusion.

Dexamethasone dosing:

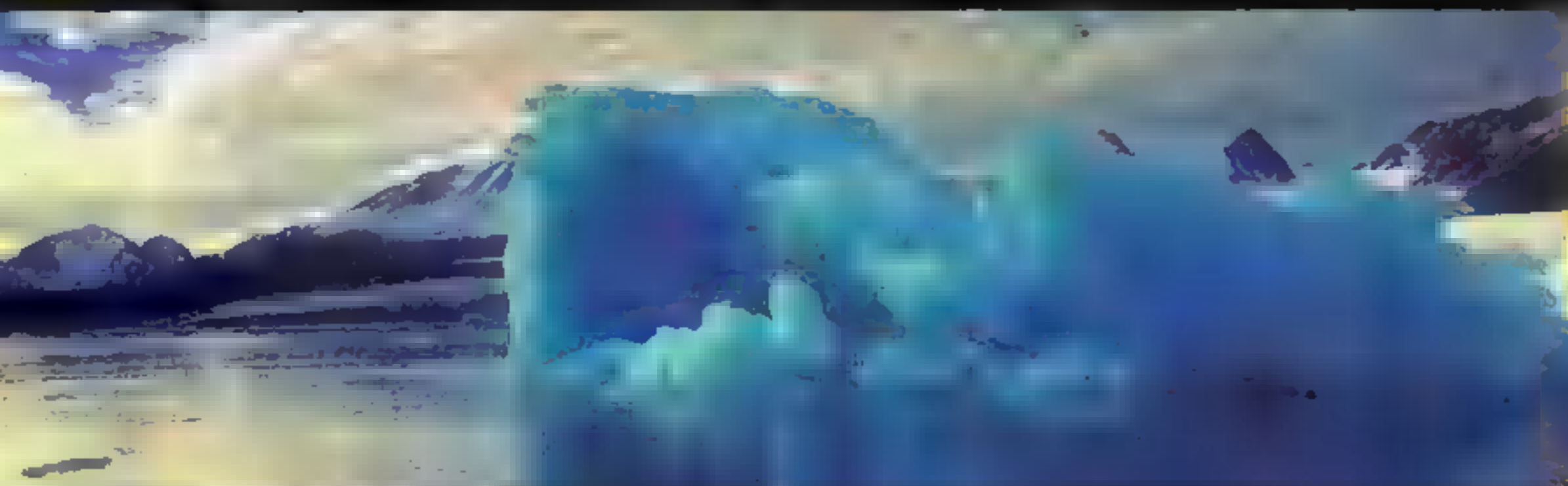
Date: _____	Time: _____
Date: _____	Time: _____

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A vigil in Jersey City, New Jersey, for the 9/11 victims.

DNA's Sad Duty The collapse of the World Trade Center five years ago was so violent that the remains of nearly half the victims are still unidentified. Many of those lost—photos of whom (below) appeared all over Manhattan soon after September 11, 2001—may never be identified. But for approximately 20,000 bone and tissue remains that have been discovered to date, DNA analysis has been crucial. “The condition of the bodies was ter-



rible,” says Pennsylvania State University professor Robert Shaler, who oversaw DNA identification for New York City’s Office of Chief Medical Examiner. “The most important part of the work was the families,” he explains. “To bring closure to them, that’s what we were working for.”

The work is not over. As the Deutsche Bank tower near ground zero was recently prepared for demolition, some 700 remains, mainly bone fragments, were discovered on the building’s roof. And thousands of samples too degraded to yield identification have been frozen to await better technologies that may emerge in the future. —*Michael Klesius*

New York’s September 11 Disaster Statistics

- 2,749 presumed total deaths
- 1,598 victims (58 percent) were positively identified.
- 53 percent of identifications were made through DNA analysis.



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- Broccoli and cauliflower with dip
- Milk

Calories 812

Cost \$2.00

Age range 11-18

Approximate percentage of students who eat a school lunch 50



Russia

A school in St. Petersburg

- Borscht (beet soup)
- Beef cutlet
- Buckwheat
- Rye bread
- Apple *kisel* (juice drink with sugar and starch)

Calories 527

Cost 21 rubles (78 cents)

Age range 7-17

Approximate percentage of students who eat a school lunch 90

Japan

A school in Sapporo

- Wonton miso soup
- Spinach and Chinese cabbage in almond paste
- *Nattou* (fermented soybeans)
- Rice
- Milk

Calories 621

Cost 190 yen (\$1.68)

Age range 6-12

Approximate percentage of students who eat a school lunch 100



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F O S S I L S



The carnivorous “fishopod” ranged in size from four to nine feet long.

From Fins to Feet? How did prehistoric fish make the evolutionary leap to land? Scientists have unearthed fossils of an ancient species they say bridges the gap between fish and tetrapods, or animals with legs. “I call it a fishopod,” says paleontologist Neil Shubin, who with Ted Daeschler led a dig on Canada’s Ellesmere Island, a chunk of land that 370 million years ago held a tropical world of ferocious freshwater predators. Back in the lab, the team began cleaning the skeletons and discovered the creature had a neck and bore two front fins that ended with wrist and fingerlike bones—all anatomical features that fish lack. In addition to gills, the fishopod had overlapping ribs, which suggest the presence of lungs too. Such anatomy would have allowed the creature to prop itself up on land and breathe air, perhaps to elude a waterbound predator. The fishopod had plenty of reasons to come ashore, says Shubin. “These weren’t friendly waters. It was a fish-eat-fish world.” —Peter Gwin

Fresh Dirt

Take that, *T. rex*. *Spinosaurus*, a Cretaceous period dinosaur with a sail-like fin on its back, may have been ■ more fearsome predator than even *Tyrannosaurus rex*, according to new examinations of *Spinosaurus* skull fragments. Besides having stronger arms with which to grab its prey, the *Spinosaurus* had cone-shaped teeth and grew to 56 feet from snout to tail tip. The largest known *T. rex* measured a relatively puny 42

feet. The two dinos would never have met for a movie-worthy battle, however. They lived on different continents and were separated by 27 million years.

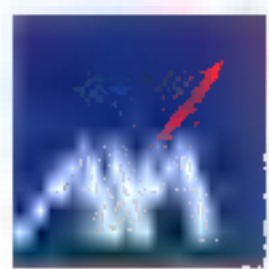
A tiny mammal that bit like ■ venomous snake lived 60 million years ago in what is now Alberta, Canada. Paleontologist Richard Fox found the incomplete skull fossil of mouse-size *Bisonalveus browni* along the banks of the Blindman River back in 1991.

Recent examination of the skull revealed deep grooves in the upper canines, resembling those in the fangs of venomous snakes. The grooves likely served as ■ gutter, guiding the poison from its production gland to the tip of the tooth. This is the first evidence of an extinct venomous mammal. Today only the Caribbean solenodon and two shrew species deliver venom from their salivary glands. None are related to the *B. browni*.

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–the 800lb gorilla in the room

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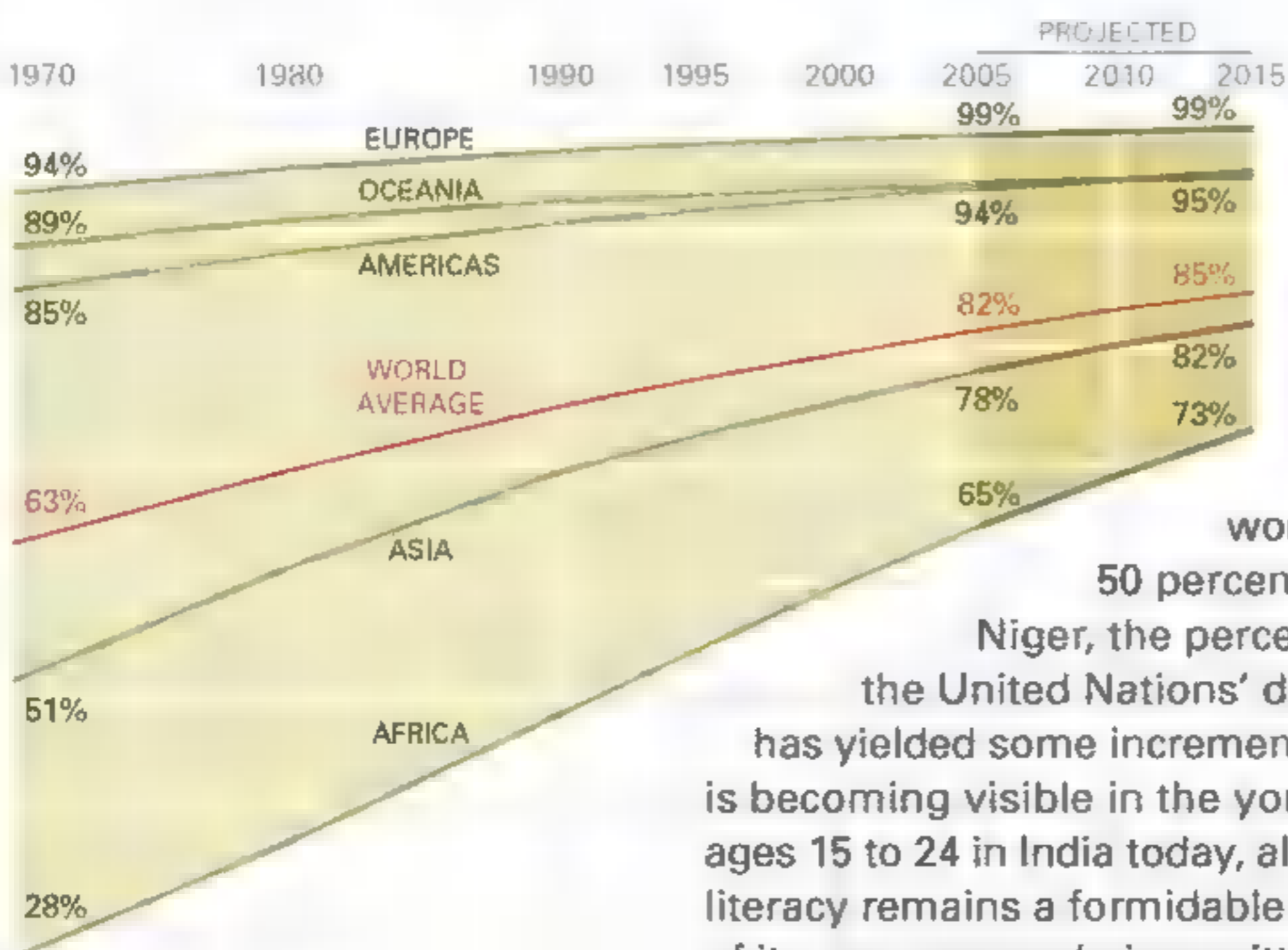
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Adult Literacy (age 15 and over)
Literacy in developing countries has kept growing over the past 35 years.



Closing the Gap

What does it mean to be able to read? At its most basic, literacy provides the ability to understand road signs and the instructions on packages of medicine. Less tangibly, reading opens the mind to new ideas and opportunities.

Literacy has risen considerably over recent decades, generating

benefits that extend far beyond the pages of a textbook. In developing countries, increased reading rates go hand in hand with higher per capita GDP and profound drops in child mortality rates. More than 770 million adults around the world are still unable to read, however—and about two-thirds of them are

women. In India, for example, less than

50 percent of adult women are literate. In

Niger, the percentage is 15. Now in its third year, the United Nations' decade-long push for global literacy has yielded some incremental but encouraging progress that is becoming visible in the younger generations. Among women ages 15 to 24 in India today, almost 70 percent can read. Universal literacy remains a formidable challenge, but the early chapters of its progress are being written. —*Siobhan Roth*



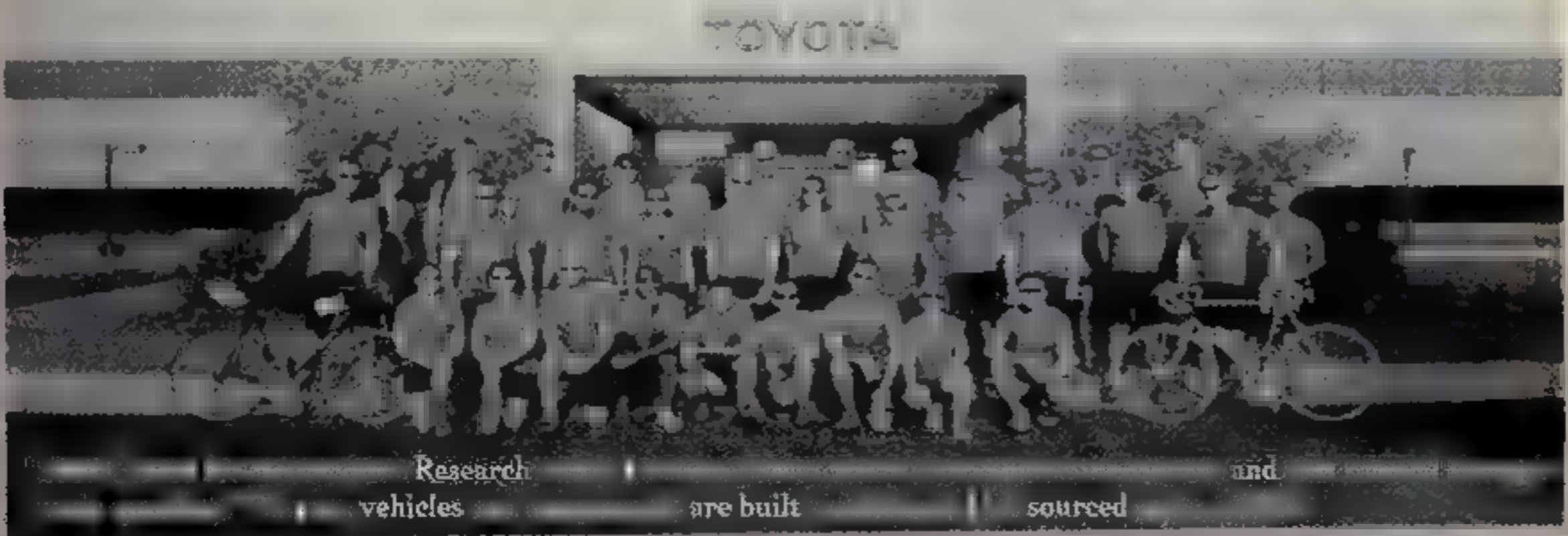
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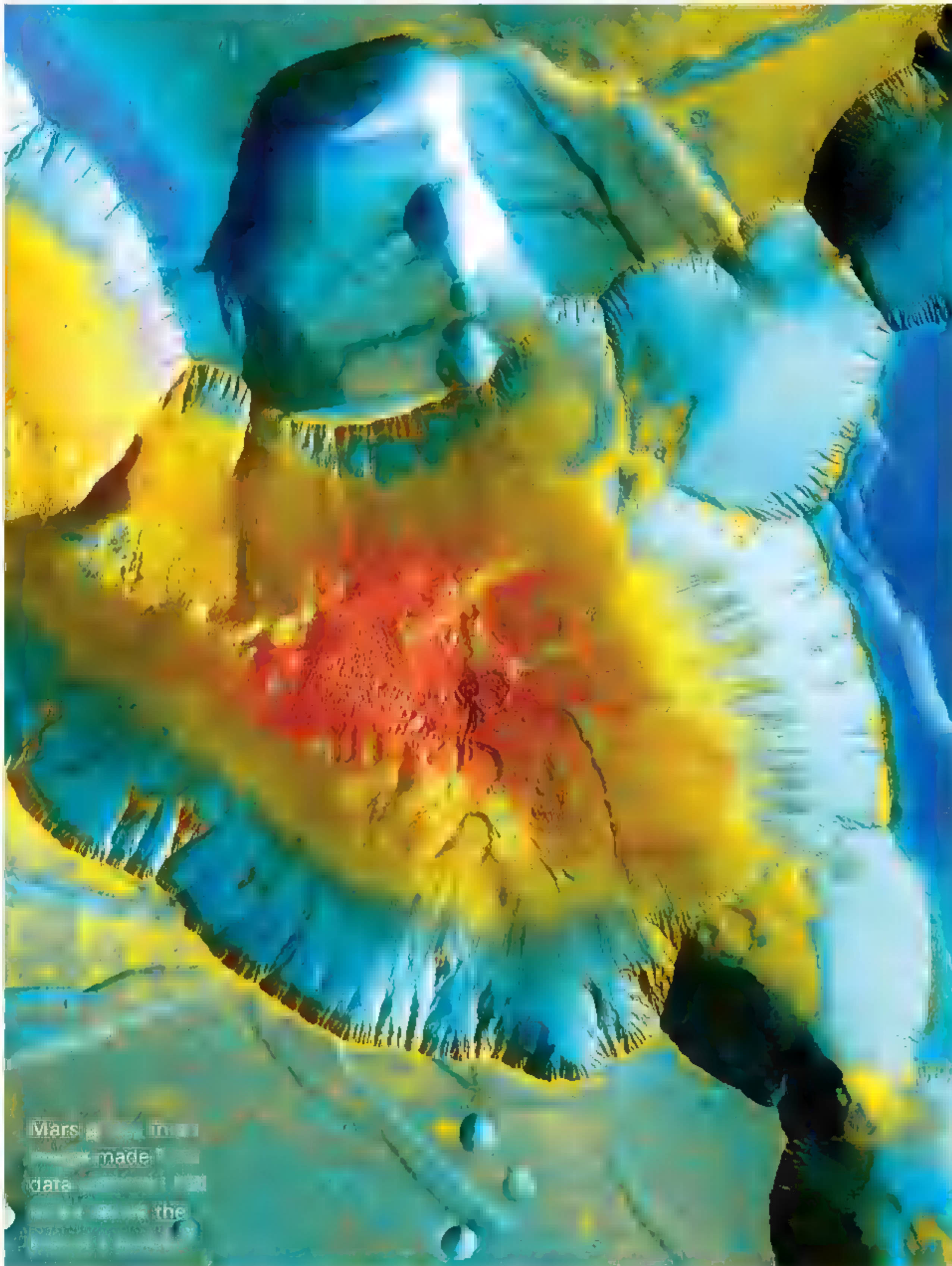
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A Different View of Mars A 13,000-foot-deep gash on the red planet comes alive in a false-color image made by the Thermal Emission Imaging System (THEMIS) orbiting on the Mars Odyssey spacecraft. Shown here is part of a formation called the Noctis Labyrinthus. Combining digital images with infrared overlays, the image shows how parts of Mars, though near each other, can have very different temperatures. Rocky regions, colored orange, cool more slowly after the Martian sunset—to about minus 100°F. Sandy and dusty areas, shown in blue, retain less heat and plunge to minus 175°F; temperatures in the yellow territory lie in between. By mapping surface temperature patterns, THEMIS helps scientists avoid rocky and dusty ground in favor of more suitable sites for landing future Mars rovers. —*Michael Klesius*

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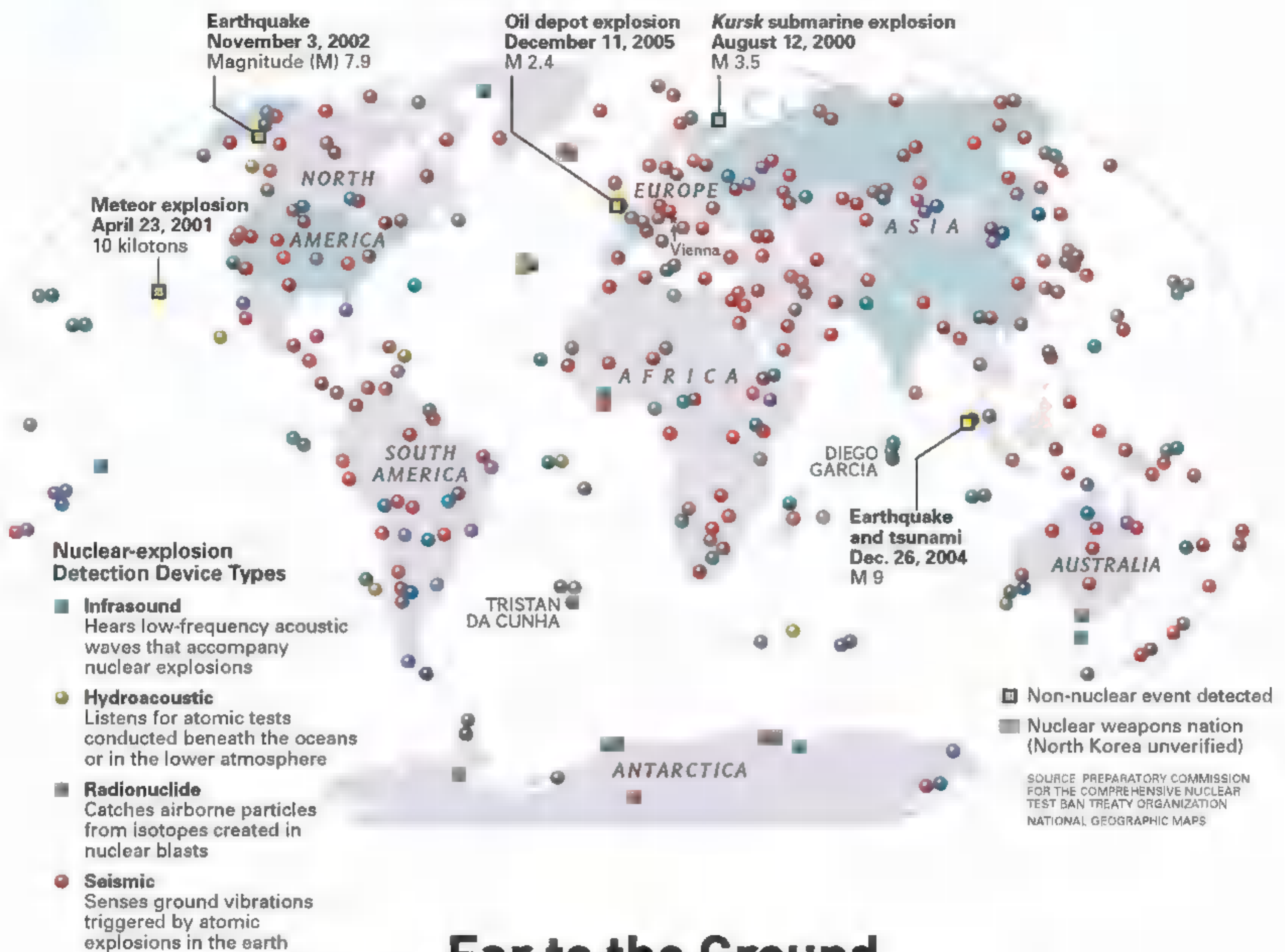
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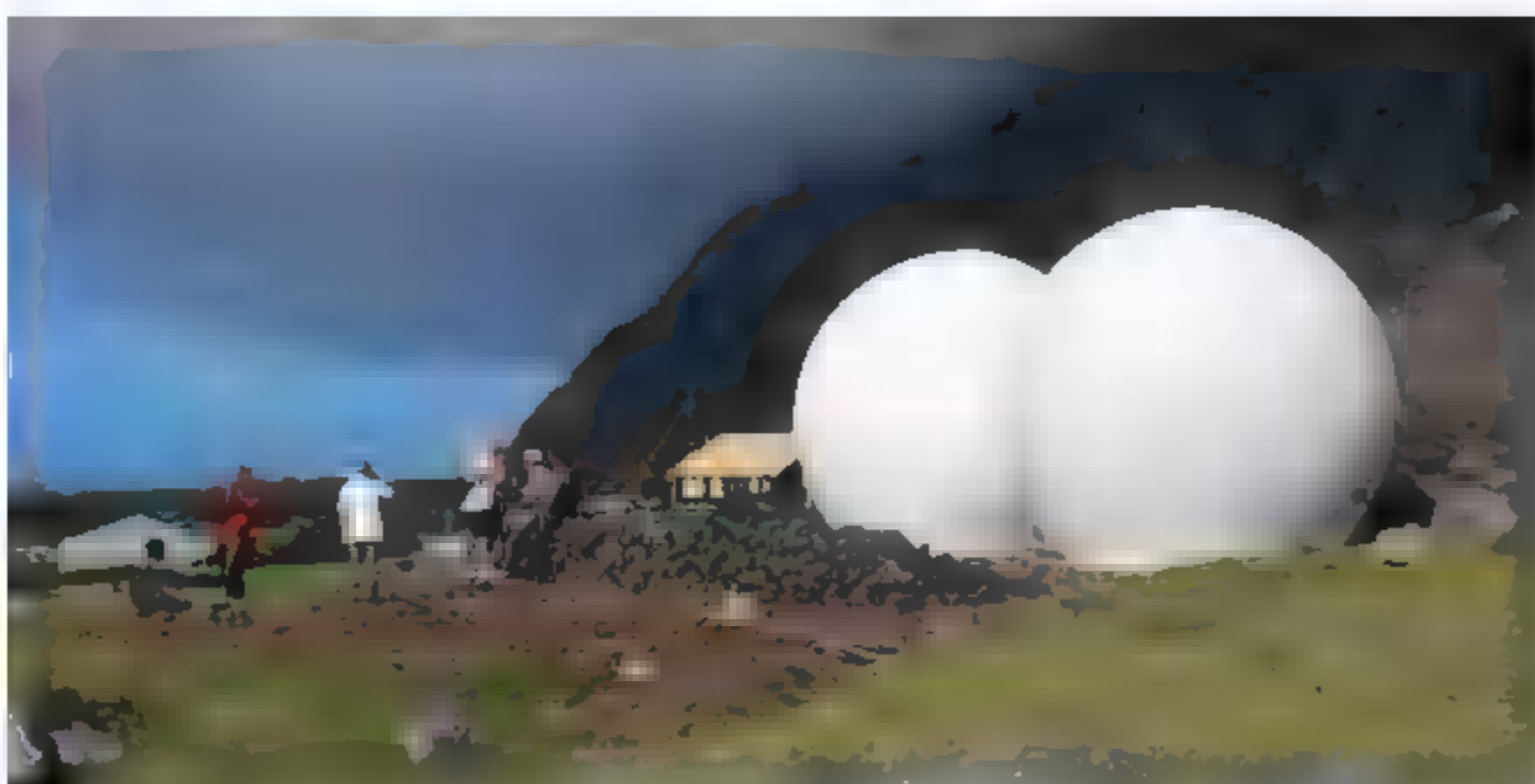


Ear to the Ground

Hundreds of monitoring stations around the globe wait vigilantly for signs of a nuclear blast. This network is the key element of the Comprehensive Nuclear Test Ban Treaty, which prohibits all nuclear explosions. Adopted by the United Nations ten years ago this month, the treaty has been ratified by 34 of the world's 44 countries that openly possess nuclear technology. Within seconds of a nuclear event, the data reaches the UN's administrative offices for the treaty in Vienna, Austria.

The system also picks up plenty of non-nuclear activity, including thousands of earthquakes each year. Sensors in Europe, Africa, and Alaska detected the undersea blast that sank the Russian submarine *Kursk* in 2000. Others, in waters off Diego Garcia, felt the tug of the Indian Ocean tsunami in December 2004 as it headed toward land. Infrasound sensors in the U.S. can even hear the space shuttle when it crosses the West Coast on reentry, its hypersonic speed creating a shock wave that causes skyscrapers in Los Angeles to shiver. —Michael Klesius

Stations on the island of Tristan da Cunha monitor the remote South Atlantic.



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Orphaned calves are returned to the wild after four years of care.

Jumbo Haven

In Sri Lanka, elephant orphans are getting second chances. The government's Elephant Transit Home (ETH) in Udawalawe National Park each year takes in 12 to 15 calves separated from their herds—often as farmers try to scare or shoot crop-raiding adults. “No elephant mother would abandon her offspring, but she might lose one in the pandemonium,” says Ian Redmond of the Born Free Foundation, which helps fund the home. Some calves arrive shot or injured from their lone wanderings. Staff feed and care for them, often for about three years, before releasing healthy animals back into the wild.

To increase survival odds at the margins of Sri Lanka's heavily peopled lands, “the ETH minimizes human contact, instead encouraging bonds between elephants,” Redmond says. Staff also radio-collar and monitor freed animals.

Such efforts are partly acts of reverence: In this mostly Buddhist country, elephants are ancient religious symbols that, during ceremonies, still shoulder sacred relics through the streets. —Jennifer S. Holland



Elephant Transit Home Statistics

- **130** Calves housed at the home since its inception in 1995
- **39** Elephants successfully released back into the wild
- **About 13 gallons** Average daily milk intake per calf
- **\$5** Daily pay for some caretakers
- **Fewer than 6,000** Wild elephants in Sri Lanka (from 12,000 in 1900)
- **20 million** Sri Lanka's human population (from 3.6 million in 1901)

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called Branch Security, and very early the next morning, they were able to access the vault and retrieve the passport Tony needed

to make his trip. To us, it's what we mean when we say we're absolutely obsessed with satisfying our customers. To Joe, it meant his son made his flight.



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— Joe Carta, Malvern, PA





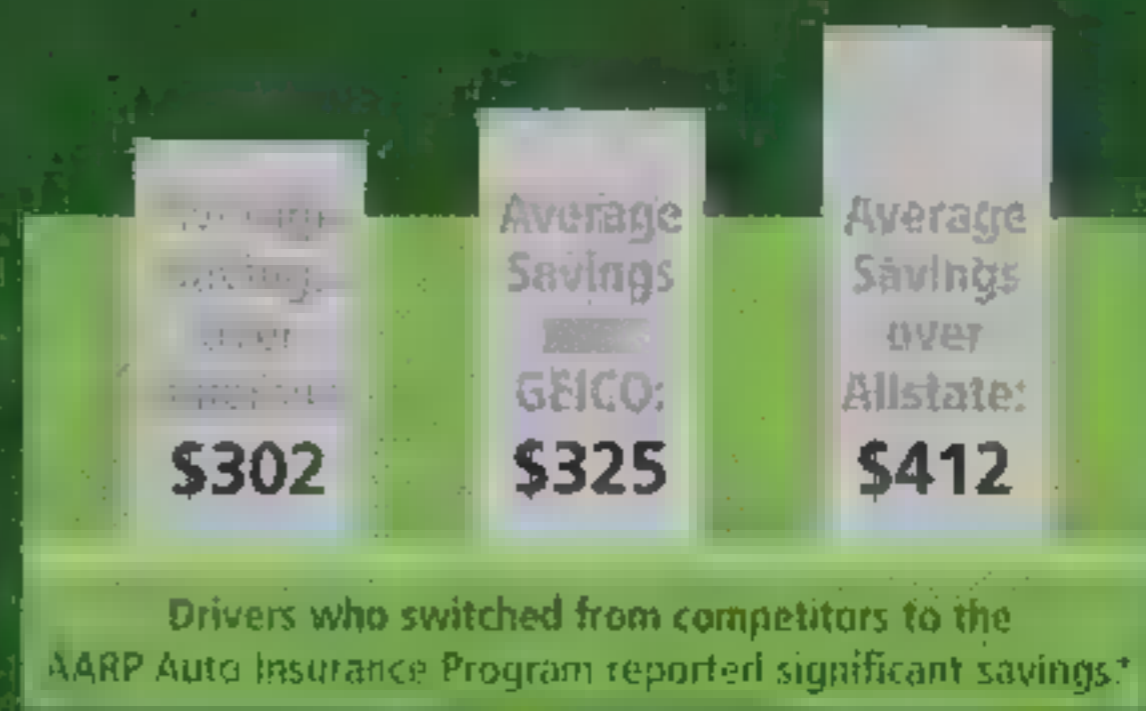
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† If you are age 50 or older, once you're insured through this Program's Standard Plan for at least 60 days, you cannot be refused renewal as long as applicable premiums are paid when due. Also, you and other customary drivers of your vehicles must retain valid licenses, remain physically and mentally capable of operating an automobile, and must not have obtained your policy through material misrepresentation.

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Marco Polo Sheep: Out in the Cold In 1273 a teenage Marco Polo crossed Central Asia's Pamir mountains where Afghanistan, China, Pakistan, and Tajikistan now meet. There he encountered—and was the first Westerner to describe—one of the largest sheep known, *Ovis ammon polii*, or Marco Polo sheep. Weighing up to 300 pounds, the animals can grow horns six feet long and live at elevations three miles above sea level.



Over the past few years, biologist George Schaller of the Wildlife Conservation Society has been studying the sheep and the effects of some 25 years of war in Afghanistan, a civil war in Tajikistan, increased hunting, and displacement by livestock herding. His findings are troubling: The sheep's numbers, difficult to tally because of

their movements across borders, seem to have dropped in all of the countries but China. Schaller is now gathering support for a Pamir International Peace Park, which would be administered by the four nations. "These are the most beautiful big sheep in the world," he says. "They've been known since 1273. We'd like to see them survive for at least another 800 years." —Michael Klesius

What's New?

Recycle those pennies. From aluminum to zinc, the world's appetite for metals keeps growing, but recycling isn't keeping up. The situation is unsustainable, says a recent study published in the *Proceedings of the National Academy of Sciences*. About 26 percent of currently circulating copper in the U.S. and 19 percent of zinc, once used, go unrecycled and are lost forever. Stores of both remain abundant for now. But for platinum, a precious metal used in catalytic converters, jewelry, and hydrogen fuel cells, the end may arrive by the close of this century. The study calls for better recycling programs, and product designs that require less precious metal.

IMPORTANT FACTS

LYRICA[®]
PREGABALIN
capsules

(LEER-i-kah)

IMPORTANT SAFETY INFORMATION ABOUT LYRICA

LYRICA may make you feel dizzy or sleepy.

- Do not drive a car, work with machines, or do other dangerous things until you are sure you will be alert. Ask your doctor when it is okay to do these things.

LYRICA may cause problems with your eyesight, including blurry vision. Call your doctor if you have any changes in your eyesight.

ABOUT LYRICA

LYRICA is a prescription medicine used to treat:

- Nerve pain from diabetes
- Nerve pain that continues after the rash from shingles heals

This pain can be sharp or burning. It can feel like tingling, shooting, or numbness. Some people taking LYRICA had less pain by the end of the first week. LYRICA may not work for everyone.

WHO IS LYRICA FOR?

Who can take LYRICA:

- Adults 18 years or older with nerve pain from diabetes or after shingles

Who should NOT take LYRICA:

- Anyone who is allergic to anything in LYRICA

LYRICA has not been studied for nerve pain in children under 18 years of age.

BEFORE STARTING LYRICA

Tell your doctor about all your medical conditions.

Tell your doctor if you:

- Have or had kidney problems or dialysis
- Have heart problems, including heart failure
- Have a bleeding problem or a low blood platelet count
- Have abused drugs or alcohol. LYRICA may cause some people to feel "high."
- Are either a man or woman planning to have children or a woman who is breast-feeding, pregnant, or may become pregnant. It is not known if LYRICA may decrease male fertility, cause birth defects, or pass into breast milk.

Tell your doctor about all your medicines. Include over-the-counter medicines, vitamins, and herbal products. Tell your doctor if you take:

- Rosiglitazone (Avandia[®])* or pioglitazone (Actos[®])** for diabetes
- Narcotic pain medicines such as oxycodone, tranquilizers, or medicines for anxiety such as lorazepam
- Any medicines that make you sleepy

POSSIBLE SIDE EFFECTS OF LYRICA

LYRICA may cause serious side effects, including:

- Dizziness and sleepiness
- Eyesight problems
- Weight gain and swelling of hands and feet. Weight gain may affect control of diabetes. Weight gain and swelling can be serious for people with heart problems.
- Unexplained muscle pain, soreness, or weakness along with a fever or tired feeling. If you have these symptoms, tell your doctor right away.
- Skin sores. In LYRICA studies, skin sores were seen in animals but not in humans. If you have diabetes, pay extra attention to your skin. Tell your doctor about any skin problems.

The most common side effects of LYRICA are:

- Dizziness
- Sleepiness
- Swelling of hands and feet
- Blurry vision
- Weight gain
- Trouble concentrating
- Dry mouth

You may have a higher chance of swelling or gaining weight if you are taking certain diabetes medicines with LYRICA. Medicines that already make you sleepy or dizzy may make you feel more sleepy or dizzy with LYRICA.

HOW TO TAKE LYRICA

Do:

- Take LYRICA exactly as your doctor tells you. Your doctor may tell you to take it 2 or 3 times a day.
- Take LYRICA with or without food.

Don't:

- Do not drive a car or use machines if you feel sleepy while taking LYRICA.
- Do not drink alcohol or use other medicines that make you sleepy while taking LYRICA.
- Do not change the dose or stop LYRICA suddenly. You may have headaches, nausea, diarrhea, or trouble sleeping if you stop taking LYRICA suddenly.
- Do not start any new medicines without first talking to your doctor.

NEED MORE INFORMATION?

- Ask your doctor or pharmacist. This is only a brief summary of important information.
- Go to www.lyrica.com or call 1-888-9-LYRICA (1-888-959-7422).



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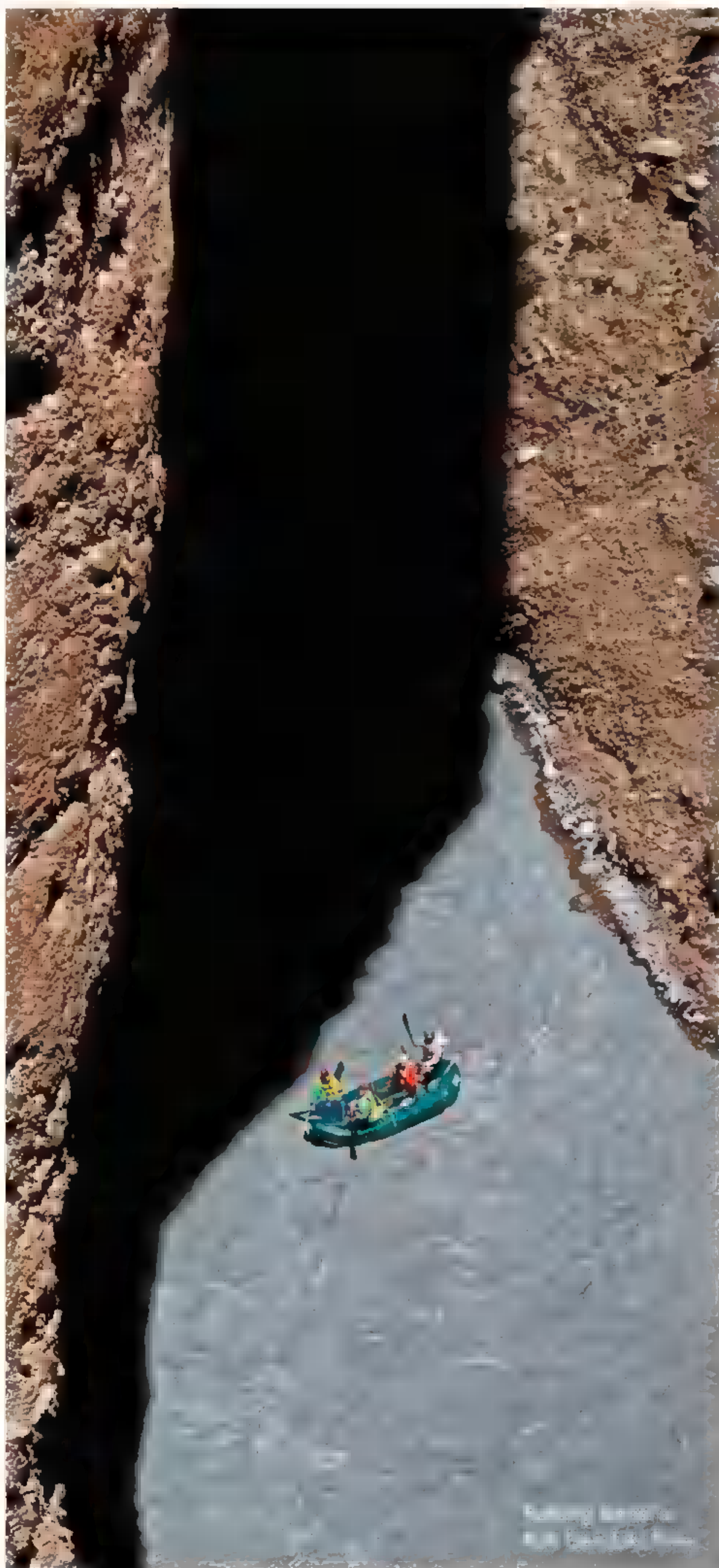
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NG GRANTEE

A Wild Ride

Rushing down from the top of the world, Nepal's Kali Gandaki offers more heart-pounding thrills than a river runner could ever want. Conservationist Broughton Coburn discovered this the hard way while leading a National Geographic expedition to Mustang, an isolated region of farmers and herders.

Coburn hoped the river's upper stretch could aid the economy as a waterway for transporting produce to distant markets. But a treacherous slot canyon, where water hurtles through a narrow gap between soaring cliffs, interrupted this first attempt to raft the upper Kali Gandaki. Coburn's team had to trek a day and a half to get past the gorge.

"It would be navigable except for that canyon," says Coburn. "It's just too risky for routine travel." Eventually, a road now under construction will provide an alternate route. A more immediate benefit has come from the expedition's modern rafts, donated by National Geographic to a local foundation for use along safe stretches of the river. —Cliff Tarpay



PHOTO: ACE KVALE

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Alaa Al Aswany Voice of Reason

INTERVIEW BY KAREN M. KOSTYAL

*Just who is the Arab world listening to? Not only radical sheikhs and militant politicians. The man whose voice has captivated the Arab public is a Cairo dentist by day and a novelist by dawn. Alaa Al Aswany's novel *The Yacoubian Building* is a phenomenon—the best-selling novel in the Middle East for two years and the inspiration for the biggest budget movie ever produced in Egypt. The novel paints a poignant and uncompromising picture of life in modern Cairo, as seen through the eyes of a carnival of characters—from the richest and most powerful to the poorest. An outspoken critic of the Mubarak regime and a friendly, self-effacing man, Dr. Al Aswany studied dentistry, and the American way of life, in the U.S. He has a humanist's love of pondering what makes people do what they do.*

There is much talk now of a “clash” of civilizations between the Muslim world and the West. How do you ■■■ this clash?

I don't think it's a question of civilizations. Civilizations are the best part of human creation. They don't cause any kind of clash—they are a means to communicate. The clash comes from the aggressive interpretation of some religions. Religions have been used throughout history as a cause to wage war and kill people, but it's my opinion that religions are the same everywhere. They are a way to find God, a way to have positive values, to prove oneself as a good human being. I was born Muslim, so I am Muslim. If I had been born Christian, I would have been Christian.

Where do you think the current fanaticism is coming from?

Poor areas, because the poor are desperate. The current regime here is dealing with them in an inhuman way, arresting and torturing them. Religion is being used as a cover for social unrest, a way to empower these people who are not empowered. In Egypt, there is an Islam for the rich and an Islam for the poor. And these two Islams have their own mosques, their own sheikhs. The rich use religion to ensure the status quo. They don't want any change. But poor people do want change, because they are now deprived of so much.

So God is not the true impetus behind extremist behavior?

You feel God in your heart, you feel God when you love others. Killing is not done because of God, but because people are marginalized and oppressed, without any future and any kind

Dr. Al Aswany's novel *The Yacoubian Building* has earned him a literary reputation, often compared to that of Gabriel Garcia Marquez. When he walks the streets of his native Cairo,



In 2005, when Egyptian men and women went to simple polling stations like this one to vote, they were often harassed by security forces or found station entrances blocked by government guard units.

of human dignity. I tried to explain that in my novel. It is very easy to get such people to turn to fanaticism. The Western notion that Muslims are killing themselves so they will go to paradise and sleep with a woman is wrong—I myself think sleeping with a woman is much more enjoyable than killing oneself. This life is closed to these marginalized people, but they believe that they will have justice in the afterlife.

Do you think the Muslim Brotherhood can moderate itself?

They claim they are now better educated and more moderate, but they have bad records about the roles of women and other issues. They have a chance now to prove themselves by what they do in parliament. They must pass the test. They must act in moderate ways. I am for the right of everybody to form a religious political party, but they must do so according to secular means.

Some people believe there can never be a true democracy in Egypt. Do you agree?

I disagree. We must begin with democracy. But the Arab regimes play games with this word. They say there has to be an interpretation of democracy that fits the Arab world. I don't believe that. We need Western-style democracy, with a free press and the rule of law, where all people can choose their elected officials. People do not need to be educated to vote. You may be poor, but making the choice for democracy is not complicated. A person makes choices every day.

There is a lot of discussion about the role of women in society. What do you think it should be?

I don't see women as women, I see them as human beings. So I don't believe that you must encourage women particularly. Introducing the issue is like dealing with women as handicapped members of society.

How do you think the Arab world sees 9/11?

The question is rather, how has 9/11 been introduced to the Arab world? I saw 9/11 as a crime, and I have written against it. But I believe that events are always manipulated by regimes for their own purposes. Just as the American government has used Osama bin Laden to deflect attention away from its own problems, many of the Arab governments used 9/11 to play on anti-American emotions. They were hoping to convert the negative emotions people harbored against their regimes and channel those emotions onto a foreign entity. They also need the problem of Israel for the same reason. I do not agree with Israeli policy toward the Palestinians, but Arab regimes use anti-Israel sentiment to postpone moving toward democracy.

You've talked about the importation of Saudi values to Egypt, would you elaborate on that?

Over the past 25 years, about a quarter of the Egyptian population



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I believe America has made a big shift to the right. The whole world has shifted to the right in a way. . . . We don't respect free choice anymore.

has gone to Saudi Arabia at some point to work. Those workers were often uneducated Egyptians, and the Saudis were rich. The Egyptians were influenced by the Saudi interpretation of Islam and brought it back with them when they returned to Egypt. That interpretation—Wahhabism—is very strict and concerned mostly with form, from wearing the veil to enforced prayer five times a day. It is an aggressive, intolerant approach that institutionalizes Islam as a state religion rather than allowing people to interpret it in their own individual ways. The Saudis have spent millions to export Sunni Wahhabism throughout the Middle East, in part because many Arabs in the Gulf States are Shiite. The Saudi princes fear the spread of the Iranian Shiite brand of Islam, which is more revolutionary and allows for more individual rights. Throughout much of Islamic history, Sunni governance has been in the hands of sheikhs who were in league with governments. The Shiites were usually shut out of power, so they had time to think and come up with a new, more humanist interpretation. I'm not comparing Iranian human rights to those in England, but in relation to Saudi Arabia, Iran has more respect for individual political rights and the people's right to know what's happening. And I must remind you that the American administration has been the most powerful supporter of the medieval Saudi regime because of Saudi oil. To support them is like having a tiger in your house.

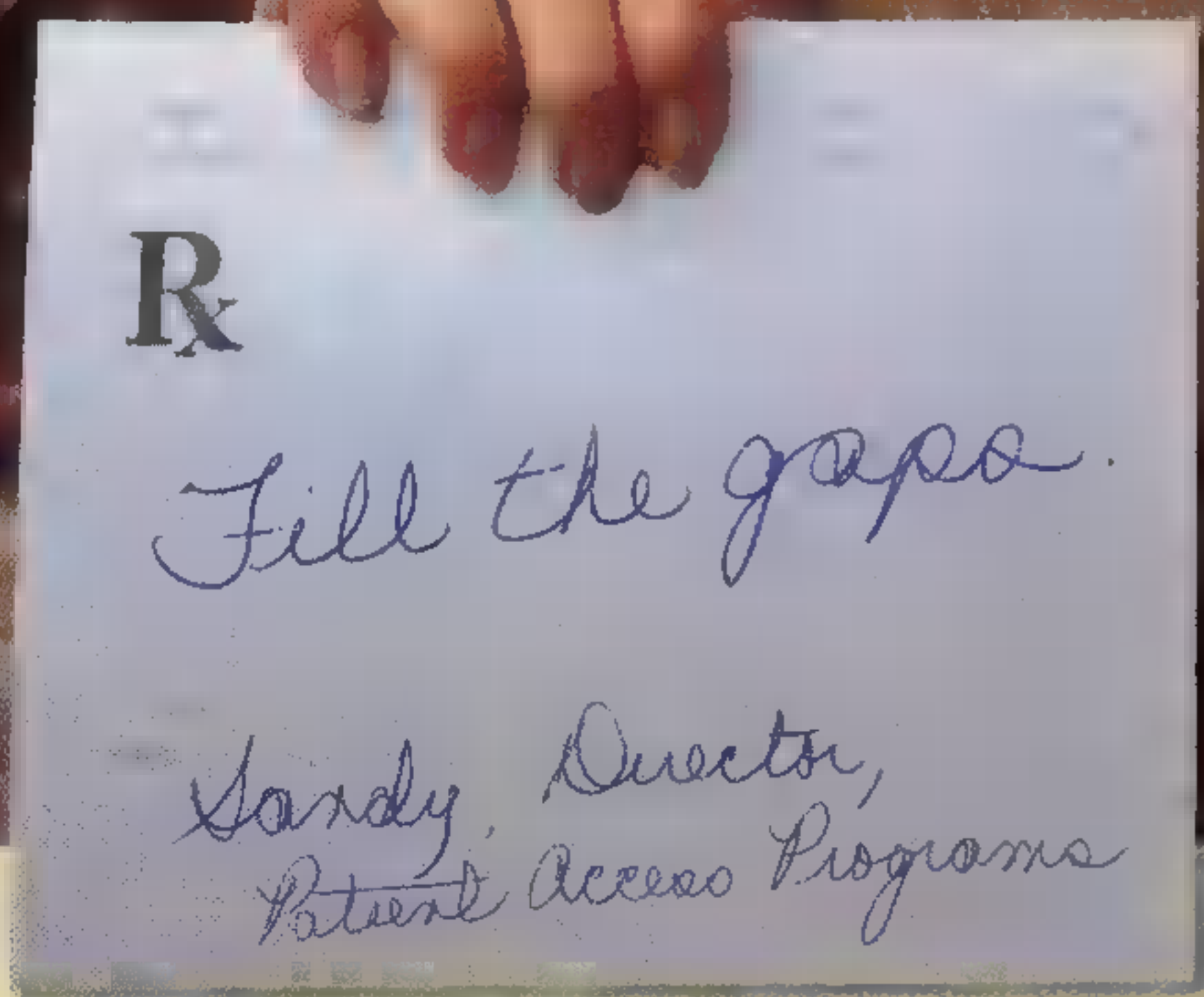
You studied dentistry at the University of Illinois in the 1980s. How did you feel about your time in the U.S.?

It was very positive, first because I was in Chicago. Before I went, I had heard about Chicago only in relation to Al Capone and shooting and all this kind of thing. And my impression of Americans was based on American foreign policy. America has supported bad regimes for years, and many Egyptians don't make the distinction between the American government and American people. But I had the chance to see that Americans are very helpful, tolerant people. They have a great ability to tolerate many cultures. I often tell a story about an experience I had one windy Chicago day. I was walking across the campus at the University of Illinois, holding my thesis, when the wind blew it out of my hands. All the people walking past stopped to help me gather the pages. This is the real American character.

What do you think of America now?

I believe America has made a big shift to the right. The whole world has shifted to the right, in a way. From the 1950s to the 1980s, people were more liberal. We don't respect free choice anymore. The globe has one superpower, and that superpower has to choose to be either a moral superpower or a capitalist superpower. This choice will influence history.

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For centuries, the Khan el Khalili has been Cairo's favorite suq, its spices, perfumed oils, water pipes, and handcrafts reflecting the many cultures that inform the Egyptian character.

America should say, "I am very strong, but I am fair." This isn't happening now.

How would you compare Europeans to Americans?

Europeans have many more traditions, because they come from very old cultures. It's like comparing a young person to an old one. The old person doesn't accept change. But the American experience is based on change.

Using that analogy, where would you put the Egyptian character, since you have a history thousands of years old?

We have been influenced by many cultures over the past 8,000 years. This has enriched the Egyptian personality. You can still even feel the pharaonic filament in our character. It makes us more peaceful and open than other people of the Arab world. It's almost impossible for Egypt to become fanatic. There will always be Egyptians who say no to this. We will never be like Iran.

When you talk about the Egyptian character and the American character, you ■■■■■ to say some of the same things. Do you think there's a similarity?

Yes, yes. That is exactly what inspired me to write my latest novel, which is set in Chicago. I believe human beings have many things in common—a son is a son, a daughter is a daughter, a lover is a lover everywhere. But there is a lot of misunderstanding between people, particularly in certain situations. In Chicago, I saw poor people whose desperation led them to violence, in the same way that desperate Arabs become violent. And I was working in a department at the University of Illinois where all kinds of nationalities were present. Chinese, Japanese, Russian, Egyptian. I saw the kind of cultural shock that uneducated Egyptians coming to Chicago had. I was very inspired by the rich mixing of cultures I saw there.

Did you have any idea when you were writing *The Yacoubian Building* that you would become a superstar?

No, I never had any idea of this. I had had success before in literary circles with my other books, but what has happened with *The Yacoubian Building* is very rare for a novel in Egypt or the Arab world. Gabriel García Márquez said if you want to make a political point, write a good book. But writing a political novel was not my first intention. When I want to write about politics, I write essays. My intention when I write novels is always to discover characters. All human beings have inside themselves many political and social issues. If you think about your life, you'll find that your life has been influenced by political and social change.

How do you feel about the movie that has been made from your book?

I didn't write it, so I'm really not responsible for it, but I'm

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sweet dreams

I don't think about my safety. Probably because I'm not wise, but...if I get scared, I cannot write, and if I write, I am not scared.

optimistic. It has a very big budget and some of the biggest actors in the Arab world. Movies and literature are different artistic languages. The novel writer has total freedom to write what he wants, a movie is teamwork. But I love seeing my characters enacted on screen.

How does your life as a dentist impact your life as a writer?

Very positively. You cannot make a living from writing, unless you write for the cinema. Even Naguib Mahfouz [the renowned Egyptian novelist and Nobel laureate] kept working for the government until the age of retirement. I can write independently—whatever I want—since I don't write for money. And the characters I meet through dentistry help me understand how people feel. I write about people, and I treat people. When I go from one to the next, I don't feel that I've made a very big trip. I don't see writing and the clinic as different worlds.

What is your daily routine?

I have a very firm schedule. I must wake up at six a.m. or I feel very guilty. I write from 6:30 to 10:30 six days a week, like a soldier—no interruptions. Then I read the newspapers and have a shower. I go to my clinic just beside my house from noon to three, then I have a nap because it's very hot during the afternoon here. From six to nine in the evening, I return to my clinic to work, and from nine to midnight, I read. For five or six days a week, I don't go out. My life is confined to my work, my family, my books, my writing.

Your fellow Cairene writer Naguib Mahfouz was stabbed by a fanatic one evening in 1994. Do you worry about your own safety?

No, I don't think about my safety. Probably because I'm not wise, but I don't. If I did, I would worry about the government much more than extremists. If I get scared, I cannot write, and if I write, I am not scared.

So you choose not to think about it?

No, I don't. But last winter my son was involved in a serious accident. He had just graduated from college, and a car hit him here in Cairo. I had been writing many articles, speaking out strongly against the regime, and some of my friends said, "You see, the regime did this to your son." But I don't want to think this way. Because what is going to happen is going to happen. In a way I'm protected by the fact that many people know me. So before doing something to me, the regime must calculate the repercussions. Rather than harming me, the regime would probably entice me to play for its team by offering money, a comfortable life, many things. The other thing they might do is exclude me from any kind of cultural activity. But I am beyond this. I don't need them—and they do need me. □

THE MANCHURIAN MANDATE

CHINA LOOKS TO A NEW GENERATION
OF "MODEL WORKERS" TO REVIVE ITS
DECAYING INDUSTRIAL HEARTLAND.





Ma Weilong makes property transactions insurance of
a daily X... is a state-run insurance plant in
Shenyang in China's Northeast enters the world
of private insurance and consumer products.



High-rises will likely swallow ■ Japanese-era neighborhood in the prospering port city of Dalian.



For now, ■ simple food stand serves locals, many of them migrants who came looking for work.



Brazilian dancers flutter atop the entrance of Movie Wonderland, ■ theme park built to



lure visitors to Changchun, better known for its auto plants and Mao-era film studios.

BY BROOK LARMER

PHOTOGRAPHS BY FRITZ HOFFMANN



The stacks and steam of heavy industry rule the skies above ■ workers' settlement in Tonghua. The hulking coal-fired power plant and iron-and-steel mill provided muscle to the all-out effort of Chairman Mao to turn the Northeast into ■ massive, state-financed industrial zone. The chimneys here will keep smoking as the steel company negotiates a deal to mine one of the largest iron ore deposits in neighboring North Korea.



There is no turning back. That much, Iron Man knows.

The bus is starting to roll down the rutted dirt road in Dongfa village, carrying the young worker and his wife away from this ghost town near the Russian border. The couple squeeze into the backseat, she carrying a bright blue gym bag, he the dull burden of history. Twenty-six years ago, his parents named him Wang Tieren, or Iron Man Wang. It was a tribute to the communist icon whose selfless toil symbolized the industrial muscle of China's Northeast, a region whose state-run factories and furnaces fueled the communist dreams of the People's Republic. The new Iron Man on the bus—silent, gaunt, a look of worry wrinkling his freckled brow—embodies the same region but in a challenging new era: Even as other parts of China flourish in the mad rush toward a market economy, once proud Manchuria (as the area is known abroad) has fallen on hard times; it, like Iron Man Wang himself, is desperately searching for salvation.

As the bus pulls away, Wang stares ahead into the middle distance while his wife, Sun Jing, buries her head in her arms. Neither dare glance out the rear window at what they are leaving behind: their two-year-old daughter, named Siting, nestled in the arms of Wang's father. It was barely a year ago, just ten days after Sun had finished nursing, that they first left their daughter. When the couple returned home two weeks ago, they proudly unrolled a thick wad of cash—their annual savings of nearly \$2,000. The money will feed their parents and daughter for another year, but Siting didn't comprehend. Recoiling from the two strangers standing in front of her, she scrambled over to her grandmother and peered out anxiously from between her legs. For two weeks, Wang and Sun have used hugs and sweet biscuits to win their daughter's trust. She has finally learned to call them "mama" and "baba," but when they boarded the bus to leave for another year, the girl showed no emotion. "It's hard to bear," says Wang, laying a hand on his wife's arm as she wiped a tear off her cheek. "But there's no other way for us to give our daughter a future."

Pursuing a better future takes Iron Man and his wife through the three northeastern provinces—Heilongjiang, Jilin, and Liaoning—that make up the region once revered as the “cradle of industrialization.” Their odyssey from the depressed northern reaches of Manchuria to their final destination near the glittering port city of Dalian in the region’s more vibrant south mirrors, in many ways, the government’s own ambitious plans for the northeastern rust belt. In 2003, shortly after coming to office, President Hu Jintao and Premier Wen Jiabao unveiled a program to turn the Northeast into China’s next engine of development. In the hands of American marketing gurus, the campaign slogan, “Revitalize the Northeast,” might well have been the “Manchurian Mandate.” The road to salvation, for the region as well as for Iron Man’s family, will demand sacrifices: a break with the past, a voyage into the unknown—and no guarantee of success. But the journeys, at least, have begun.

Why would China’s leaders stake their legacies on the dubious prospect of resuscitating a region overtaken by history? Part of the answer lies precisely in Manchuria’s historical symbolism. Though first developed by Japanese and Russian colonists, China’s Northeast was championed by Chairman Mao as the soul of the communist industrial revolution. During the early years of the People’s Republic, vast armies of workers were deployed to man the new state-run mines and factories, churning out coal, steel, and oil, along with cars, trucks, ships, and missiles—all the products that would finally, after several thousand years of agrarian life, turn China into an industrial power. By the early 1980s, the Northeast produced 16 percent of the country’s industrial output with just 8 percent of the population, making it one of the richest regions in an ostensibly egalitarian society. Iron Man ruled.

In just two decades, however, China’s Northeast has gone from dynamo to dinosaur, tracing virtually the opposite trajectory of the country’s thriving southern coastal regions. The frenzied

economic growth that has propelled Shanghai and the southern province of Guangdong headlong into the global economy has largely bypassed the land of the Iron Man. The region’s industrial production has sagged to less than 9 percent of national output, while its heavy reliance on state-owned enterprises—once a blessing, now a curse—has made market-oriented reforms seem like all shock and no therapy. The landscape left behind is not simply the corroded shell of the great socialist experiment but a stark tableau of the most intractable problems China faces in the wake of its unequal boom: Thousands of obsolete state-run factories, millions of laid-off workers, a growing gap between rich and poor, rampant corruption, deadly human and environmental disasters, and, hovering above it all, the specter of social unrest. “The government can’t afford to let frustrations boil over in the Northeast,” says Li Cheng, a professor at Hamilton College in New York State. “The cost would be too great.”

Hoping to reverse this dangerous slide, Beijing has so far spent 7.5 billion dollars to rehabilitate the region, closing or privatizing old state-owned factories while retraining workers for industries more suited to the 21st century: computer assembly, software engineering, even tourism. The real key, however, will be foreign investment. The region that once symbolized China’s drive for self-sufficiency is now unabashedly courting foreign investors, notably its former occupiers Japan and Russia. It is too early to tell whether the rust belt can truly be revitalized. But all along Iron Man Wang’s route south can be found signs of a region, and a people, struggling for a new future. These are the beginnings of Manchuria’s great capitalist experiment.

It is all an illusion, the picturesque scene of twin peaks silhouetted against an azure sky, their upper reaches swathed in wisps of vapor. These mountains on the outskirts of the city of Qitaihe in Heilongjiang Province are not mountains at all but massive heaps of discarded rock and coal coughed up by the mine far below. High on one

RUST BELT GAMBLE

Revitalizing Dongbei, as the Northeast is known, will test China's run of economic success (sequence below). The region's former strength—the ability of its state-owned enterprises to produce cars, steel, ships, and oil in the early days of the People's Republic—has become a liability. Applying the formula that has worked elsewhere—foreign investment and export-driven growth—the government has closed or partly privatized many industries and used investment from neighbors such as Japan and South Korea to build modern software and manufacturing plants. But with China's highest urban unemployment rate and widespread corruption, the Northeast will likely stumble, not sprint, toward success.



GROWTH ENGINES

1932-1945

Japanese Occupation
To fuel its war efforts, Japan introduced heavy industry to the region in the 1930s.

1949

Industrial Heartland
With the founding of the People's Republic in 1949, Mao Zedong aimed to make China self-sufficient by turning Dongbei into a manufacturing center.

1979

Pearl River Delta
In 1979 the first special economic zone, on the south coast, opened China to foreign investment.

1980s

Yangtze River Delta
Beginning in the 1980s, Shanghai emerged as a trading hub and magnet for foreign investment.

1999

Develop the West
A campaign launched in 1999 sought to expand China's boom to the interior.

2003

Dongbei
In 2003 China's leaders vowed to revive the industrial Northeast.

steep incline, nearly 500 feet up, a scavenger named Chang Mingdong trawls for usable fragments of coal, dodging fresh loads of rock careering down the embankment, sidestepping the coal embers smoldering beneath the surface. Chang has spent nearly half his life—12 of his 29 years—in the dark bowels of the Qitaihe coal mines, performing one of the most dangerous jobs on Earth. Yet he can't afford the coal he needs to heat his own home, especially on winter days like this, when the temperature drops to minus 20°F. So when his shift underground is over, Chang staggers up the mountain with his wife to scavenge for coal.

Covered with black soot from his wool cap to his thick boots, Chang personifies the stubborn traditions of a region most Chinese refer to simply as Dongbei, which means Northeast. Chang's father was one of several million laborers who moved to northern Manchuria four decades ago to fulfill Chairman Mao's vision of turning China into a socialist industrial giant. Some of those workers ended up in the region's iron and steel mills. Others went to the oil fields of Daqing, a one-industry town where the iconic "Iron Man" toiled. Chang's father landed in these rolling hills near the Russian border, a key zone in a country where coal is still king: China is the world's largest producer and consumer, with 80 percent of its soaring electricity demand fueled by coal-powered plants.

Not much has changed for Qitaihe miners in 30 years—except the world around them. The privatization of some local mines, along with alleged government corruption, has spawned a prosperous new class that exists side by side with the old. Modern high-rises tower over huts in Xinjian Coal Miners' Village; sleek black Audi sedans zoom past miners straining to haul wooden carts up a hill. The wealth has not trickled down to Chang and his family. In the shadow of a coal mountain, he and his wife, Yuan Chenglian, subsist on a diet of cabbage, potatoes, and corn gruel, splurging on meat only twice a year. One of the few decorations in their spartan home is a wedding photo showing a well-scrubbed couple in rental finery—he in a black tux, she in a long white gown carrying a dainty parasol. Yuan looks at her grimy clothes and laughs apologetically. "These photographers," she says, "can make anybody look beautiful." *(Continued on page 57)*



**“THE GOVERNMENT CAN'T
AFFORD TO LET FRUSTRATIONS BOIL
OVER IN THE NORTHEAST.”**



A stubborn relic, Tonghua Iron and Steel operates the old-fashioned way—subsidized and controlled by the Communist Party. Some 29,000 employees labor amid the blast furnaces, centerpieces of a huge complex that opened in 1958. With China the world’s top steelmaker—producing 30 percent of the total—and the leading consumer, the Tonghua complex remains a vital state asset.



Desperation forces people in Xinjian Coal Miners' Village in Qitaihe to scavenge ■ 500-foot-high

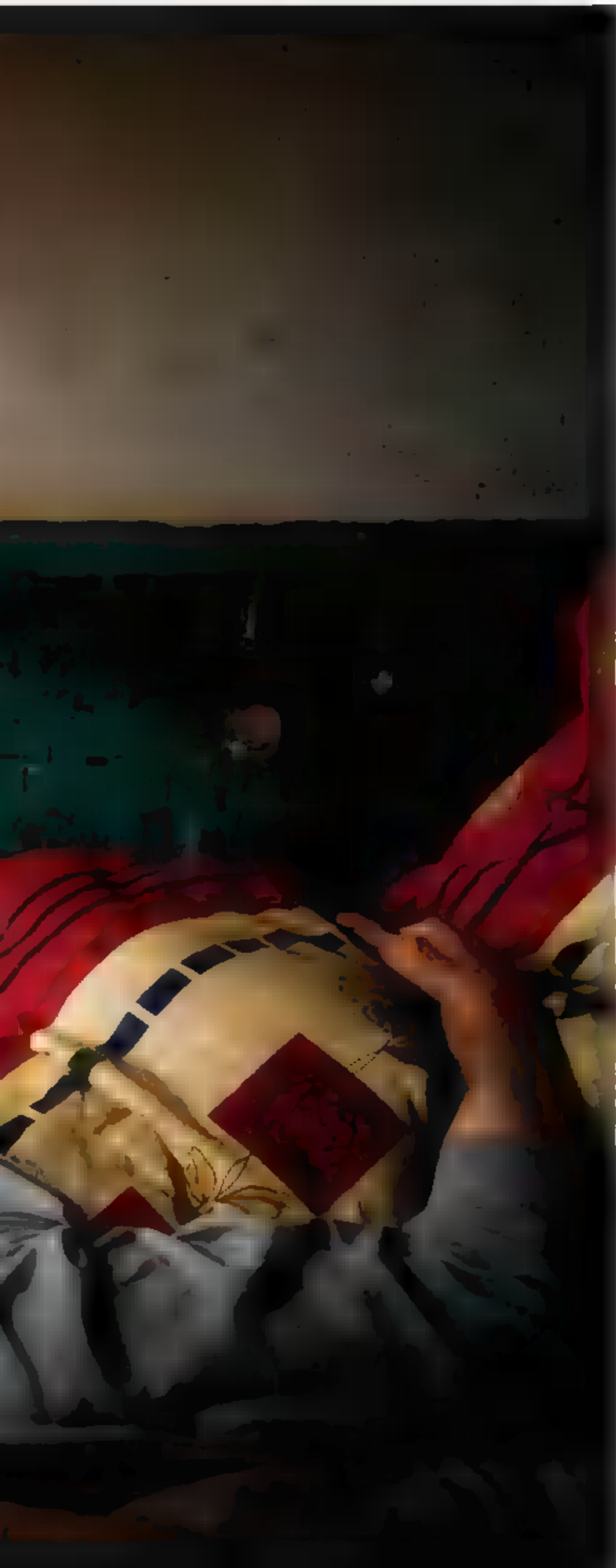


slag heap for usable chunks of coal. Many of the villagers toil in the area's coal mines.

LOOMING IN THE BACKGROUND
IN THE DARKER WORLD OF THE XIAGANG—
THE LAID-OFF STATE WORKERS.



Bedridden from a stroke, Chen Guangxiao, 75, and his unemployed son, Lianshun, await the inevitable: eviction from the once prestigious “model workers’ village” in Shenyang’s Tiexi Industrial District. Eager to develop the property, the government has condemned the complex, but 400 residents are balking over compensation. “They’re forcing us out,” said neighbor Nian Shifu. “They’ve cut the water and burned the wires. What can we do?”



(Continued from page 52) An explosion at a nearby mine where Chang's father works killed 172 miners last November, pushing the Chinese coal industry's death toll for 2005 to 5,986—suffering nearly as many fatalities per day (16) as the U.S. did the entire year (22). Fearing a backlash among Qitaihe workers, Beijing gave all local miners an 11 percent pay raise. Chang is convinced that conditions will get even more dangerous as dwindling coal reserves drive mines ever deeper. But he is happy to take the extra cash, for he knows that, like his father, he will probably never escape the mines—or the dark mountains that loom, beautiful and menacing, above his home.

The demolition crews will not be stopped. Today, they are bearing down on one of the last stubborn remnants of China's socialist past—a crumbling five-story apartment block known as Building 8-1. For more than half a century, the Tiexi Industrial District in the city of Shenyang—460 miles southwest of Qitaihe—served as China's first “model workers' village,” home to dozens of factories and more than a million workers. One by one, the smokestacks and settlements that once breathed life into the district are coming down. Building 8-1, however, still stands forlornly in a field of rubble. Its brick hulk seems deserted until night falls, when a dim yellow glow emanates from the only intact window on the ground floor. Inside, a laid-off factory worker and his wife huddle with their two children around an electric heating coil. They are some of the last holdouts against the march of history.

History has a habit of storming through China's Northeast, spawning a new incarnation at every turn. Dongbei has served as staging ground for the Manchu conquerors who established the Qing dynasty (1644-1911), as military-industrial center of the Japanese puppet state, Manchukuo (1932-1945), and as muscular embodiment of Mao's state socialism. Today, market reforms are forcing another reincarnation, and Dongbei is struggling to adapt. With a gross domestic product of 176 billion dollars, the region's economy is still relatively large, about the size of Poland's. Yet more than 70 percent of its industrial output still comes from inefficient state-owned enterprises—a reliance that has created a sense of complacency and entitlement at all levels



A lone chimney towers over Tiexi Industrial District, where housing blocks have replaced defunct



factories—as Shenyang tries to clear the air in one of the world’s most polluted cities.



of Dongbei society, from top leaders to laid-off factory workers. William Mako, a World Bank analyst and an author of a recent report on Dongbei, says: "This mindset is the most important thing to change—and the most difficult."

Still, some things in Dongbei are changing with startling speed. Far north in Harbin, a city whose onion-shaped domes hint at its Russian history, a grandiose office-and-residential complex emerges from the carcass of a defunct locomotive factory—with a shiny gold Mao statue standing incongruously at its center. In Changchun, whose pungent corridor of North Korean restaurants reflects the city's proximity to the Hermit Kingdom, the burgeoning middle class clamors for apartments in a high-rent development called Up East Side Manhattan. (Changchun yuppies also pay good money for consultations with Wang Yiyang, a fashion guru whose message of "cultural reeducation" could serve for the region as a whole.) Even Shenyang is getting a makeover. There are now Wal-Mart's and KFCs, a high-tech industrial park, and, across one neon-lit intersection, three Ikea-like home-furnishing stores battling for business.

Looming in the background, though, is the darker world of the *xiagang*—the laid-off state workers. Of the 31 million Chinese who lost their jobs between 1998 and 2003, nearly one-quarter live in the Northeast, giving the region one of the highest unemployment rates in the country. (This has created an economic paradox: Even as Dongbei has posted an annual average growth of 9 percent over the past decade,

Escaping the ache of hard labor and loneliness, a migrant construction crew gathers at ■ Shenyang storefront to watch a video. Despite the city's high jobless rate, transients from the countryside pour in to work low-wage jobs.

urban employment has actually dropped.) Dongbei's official unemployment rate stands at just over 6 percent, but the World Bank estimates the real rate is closer to 15 percent. What's so troubling for Beijing is that most *xiagang* live in the cities, where their suffering is more visible—and their frustration more potentially volatile. The central government has headed off social upheaval by taking over parts of the social safety net that unraveled with the demise of bankrupt state-owned factories. But urban poverty is now a fixture in China's Northeast, and nobody embodies it more than poorly educated, laid-off workers in their 40s and 50s. They are the lost generation.

Back in the dimly lit room in Building 8-1, Li Zhongxu rubs his swollen hands after another unsuccessful day looking for work. The 41-year-old machine repairman lost his job at the No. 3 Wool Factory in 2001. (Li's wife, Liu Yaqin, was fired four years earlier from a pharmaceutical plant for violating the country's one-child policy; after having a daughter, she chose to keep her second child, a son, rather than have an abortion.) Having grown up on the "iron rice bowl"—with housing, education, and medical care provided by the factories—the family today scrapes by on a monthly supplement of \$17. And now the building Li has lived in all his life is slated for destruction to make way for a high-rise development. Li and Liu are resisting eviction, spurning the government's offer of compensation, which they considered inadequate. Demolition crews have torn down apartment blocks around them, cutting off all water, gas, and electricity to Building 8-1. Li now pirates electricity from the street lamps outside. But the winter nights get so cold that the family of four sleeps together to stay warm.

Each morning, Li heads to one of the informal day-labor markets that have sprung up in Tiexi. The sheer number of laid-off workers makes even manual labor hard to find, and Li isn't qualified for much else. "I only know how to fix old textile machines," he says. Hoping to retool these workers, the central government



Laborers from Mongolia rush to build a homegrown electronics company in Dalian before its executives move into Western-style mansions rising in the street below.

In Changchun, policeman Zhao Qingyan and his wife, businesswoman Jin Liming, sit proudly at home in a new development called Up East Side Manhattan. A recent vacation to New Zealand helped Zhao appreciate his new China. "We visited the homes of some middle-class people, and the homes there are not as good as ours."

has funded free retraining classes throughout Dongbei, even turning Tiexi's socialist-era Workers' Cultural Hall into a place of capitalist reinvention. The diverse classes offered there—on cooking, haircutting, computing, and English—attract eager students but rarely lead to jobs. On a recent Monday afternoon, the only moneymaking activity took place behind a heavy velvet curtain. There, in the near-complete darkness of a large circular hall, a few dozen couples clung to each other, barely swaying to the music on the loudspeaker. Heavily made-up women, many of them laid-off workers in their 30s and 40s, circled the periphery. "Ten yuan [\$1.20] for three songs," suggested one, "and you can touch me anywhere you want."

For Manchuria's lost generation, the future holds little promise. That is why Li and his wife place their hopes on their daughter, Mengxue (Snow Dream). Hunched over her Chinese grammar book, the long-limbed 12-year-old seems oblivious to the "Bugs Bunny" cartoon



playing on the black-and-white television a few feet away. Mengxue is the top eighth-grade student at Heavy Industry Middle School, even though her parents can't afford to pay another ten dollars for extra classes that could help her get into a good high school. Despite her restricted circumstances, Mengxue's imagination runs free. She writes short stories set in ancient Egypt. She dreams of attending the Cherry Blossom College for Women, a Japanese school she once saw in an advertisement. "And then," she says, "I'd like to be a teacher."

Success in the new China often springs from the most unpredictable places. If her parents are lost, why shouldn't Snow Dream be found?

"I apologize profusely for inconveniencing you."

The 12 Chinese women sitting in a small classroom in Dalian's Senmao Building repeat the phrase in tittering unison—not in Mandarin, but in Japanese, the language of their former occupier. Outside, in a much larger room with

a wall clock set to Tokyo time, several dozen Chinese operators wearing headsets are working the phones, gushing polite Japanese phrases as they sell NTT telephones and Canon copiers to customers across the sea. This call center, part of an outsourcing enterprise run by Recomm Co., Ltd., a Tokyo-based office supply and services company, is just one of hundreds of Japanese businesses flooding into Dalian, a city of six million suspended at Dongbei's southern tip. So many Japanese companies have moved into the Senmao Building—from Hitachi to Toshiba to Matsushita—that the sleek 24-story building displays a Japanese flag out front.

The second Japanese invasion of Manchuria has begun, and this one—driven by commerce, not conquest—couldn't be more welcome. So far, the bulk of this foreign investment has landed in Dalian, the showpiece of China's Northeast. The rest of Dongbei hungers for an injection of cash, too. China's growing wealth gap is usually seen as a divide between urban and rural,



Shouldering wooden guns, students at the Guo Fang Technical School in Dalian learn discipline



military-style. Many hope to work at the new German joint-venture steel plant in the background.

east and west, but it also cleaves north and south. The region's once invincible economy has now been eclipsed by Guangdong Province, whose population is more than 20 percent smaller. The three Manchurian provinces together receive less foreign investment than the city of Shanghai, even though their population (now 107 million) is nearly six times larger. Some investors may be scared off by Dongbei's reputation for inefficiency and corruption. (Shenyang's deputy mayor, for example, was executed on graft charges in 2001.) A few hardy enterprises, however, have ventured north: German automakers have teamed up with First Auto Works in Changchun, where instead of producing the lumbering old Red Flag limousine, they now roll out the Audi sedan that has become the car of choice for Chinese bureaucrats.

Dalian, however, is the only city in China's Northeast with a truly global ambition: To surpass Bangalore, India, as the world's capital for high-tech outsourcing. The city has a long way to go, but a flood of foreign investment has fueled 50-percent annual growth rates in its software industry over the past five years. Lured by tax breaks, solid infrastructure, and cheap labor—wages are approximately one-tenth of those in the U.S.—American giants IBM, Dell, General Electric, and Hewlett-Packard have all set up shop in Dalian for everything from data processing to software development. Even a handful of Bangalore-based Indian companies have shifted their outsourcing business to the Chinese city. But Dalian's biggest source of growth is the very country that ruled Manchuria more than 60 years ago. Some 2,500 Japanese companies are now operating in Dalian, accounting for nearly 80 percent of the city's outsourcing sales.

Working for the onetime enemy doesn't bother Zhang Hua. A native of a town just north of Dalian, the high school graduate was recruited by a Japanese electric-tools company five years ago. The firm had just set up a plant in Dalian and was offering monthly wages of \$120—more than her father earned in their hometown furniture factory. Zhang knew about Japan's wartime atrocities in China from her grandparents and grade-school textbooks. But her longing for escape outweighed any anti-Japanese sentiment. Zhang moved to Dalian and in her spare time began taking classes in



**SUCCESS IN THE NEW CHINA
OFTEN SPRINGS FROM THE MOST
UNPREDICTABLE PLACES.**



Even ■ beauty salon features ■ view of oil derricks, hundreds of which still bob in the city of Daqing. This center of China's oil industry once gushed revolutionary fervor as well, its workers saluted by Chairman Mao for their "Iron Man" labors. Today Daqing is losing some muscle. The oil field is drying up, and laid-off workers have staged demonstrations to protest the breaking of the "iron rice bowl," the old system of guaranteed benefits.



Russians in bikinis are common, but real sea turtles are rare on ■ Dalian beach. With its mild



climate on the Yellow Sea and its fresh air and green spaces, Dalian is becoming a top tourist draw.



Heads turn at the auto show in Changchun, one of several cities in the region catching the eye of foreign firms and trade officials after years of indifference. Here in the birthplace of the Chinese car industry, ads for new models, foreign and domestic, unfurl during the event. Toyota recently began making its Prius hybrid sedan at a Changchun plant.

In Shenyang, Russian and North Korean diplomats share toasts with local officials, as trade between their nations and China accelerates.

Japanese. Earlier this year, her ambition paid off. A headhunting firm invited her to join a three-month Japanese training program that would guarantee her passage out of the factory. The only hitch: The program would drain most of her savings—about \$620. Nevertheless, Zhang says, “it was worth taking a risk.”

The decision has led the long-haired 28-year-old to the pristine campus of Dalian's Neusoft Institute of Information, a high-tech training center nestled against a hill in the city's Software Park. With its rough-hewn stone buildings, graceful arcades, and old-fashioned clock tower, the institute wouldn't look out of place in Tokyo or Berkeley. But its mission is far more focused than most universities. Founded five years ago with public funds (and sponsored by every major IT company from IBM to Toshiba), the institute is one of several new centers in Dalian designed to feed the country's information-technology boom with the one thing that's in short supply: skilled workers.



A massive construction site just a few years ago, the campus now buzzes with more than 10,000 students learning everything from computer engineering to software programming—along with one former factory worker honing her Japanese.

Wearing a cream-colored sweater with a Chanel logo, Zhang walks into her classroom with a friendly *konnichiwa*—hello. Soon after completing this course, Zhang will take an office job at IBM Japan in Dalian, making the leap that all Dongbei is striving to achieve: from blue collar to white collar. Though proud of her progress, Zhang still hasn't told her parents she speaks Japanese—much less that she uses the language every day to deal with Japanese bosses and clients. "They just wouldn't understand," Zhang says with a laugh. The one historical twist her parents might grasp more easily is that her new monthly salary far exceeds their combined income—and gives her a coveted foothold in China's rising middle class.

Seventeen hours after leaving their daughter behind in Dongfa village, Iron Man Wang and Sun Jing arrive at the metal gate of the fish-processing plant in Zhuanghe, at the northern end of Dalian. A decorative exotic fish flashes in colored lights above a sign in English: Rifeng Aquatic Products Co., Ltd. The couple's journey has taken them from one of the most isolated areas of Manchuria into the slipstream of the global economy. Today, the wholly unexotic variety of flounder that they scale, cut, and fillet in this private South Korean factory were caught not in Chinese waters but off the coast of Alaska. The fish were shipped here for processing before being reexported to Japan, South Korea, and the U.S.

Wang now forms a link in this chain of globalization. His future, the future of his village and the entire region, hinges on that connection. But he and his wife, like the other 60 migrants from Dongfa village, have come to Zhuanghe for a much simpler reason: This factory, unlike many

**HISTORY HAS ■ HABIT OF STORMING
THROUGH CHINA'S NORTHEAST, SPAWNING
A NEW INCARNATION ■ AT EVERY TURN.**



Besieged by the glare of new stores, Wang Bin, 27, stands sentinel at the last house on ■ plot in central Dalian. “This isn’t fair,” says Wang, protesting the government’s refusal to pay for a comparable replacement. A supermarket is planned for the site. How China’s leaders deal with Wang and countless others who have lost homes and jobs will go ■ long way toward determining whether the Northeast will rise again.



others, has a history of actually paying workers' wages. The pay is hardly generous. The fastest workers, such as nimble-fingered Sun Jing, can earn about \$5 a day. But the glut of new arrivals is slowing down the lines, limiting veterans to \$2.50 and the rookies to just 63 cents. The grueling ten-hour days are also taking a toll on the weaker workers; in 2005, barely half the migrants lasted the year. The older workers do their best to keep everybody's spirits up, for they know their work is Dongfa's only hope. Last year, the 50 workers here brought back a total of \$37,000. This year, it should be more.

It is the local connections, not the global ones, that sustain these migrants. Sun Jing lives in the factory dormitory with hometown friends, while Wang and 20 other men rent two rooms behind a nearby sauna. The dimly lit rooms have no beds, just raised wooden slats on which the men sleep in tightly packed rows. The corroded water pipes running along the walls are the prize: They ensure that the men will not freeze to death at night, as they almost did last year. After his shift ends, Wang grabs supper at the factory canteen—one of the few times he speaks to his wife during the day—and returns to his room. On their one day off a month, he and the others sometimes wander the city streets, peering into the windows of the fancy department stores. "We're dressed so shabbily," Wang says, "the guards don't allow us to go in." Tonight, as usual, a group of young workers on the makeshift bed is playing a noisy game of poker, betting with cigarettes instead of money.

The haze of cigarette smoke thickens around the huddled players. Wang, the elder statesman at 26, sits off to the side, enjoying the scene—until someone asks about his daughter back home. "We didn't even bring along a photo of her," he says softly, "because we knew that every time we looked at her, we would burst into tears." Iron Man bows his head and stares silently at the ground. Behind him, a young worker slaps a card down triumphantly, and the room erupts in a cacophony of whoops and hollers. It is a bit-sweet bet these men are making, gambling on a better life in China's Northeast. □

Reviving Dongbei Explore the Sights & Sounds of China's Northeast with photographer Fritz Hoffmann, and learn more about its efforts to catch up with the country's new economy at ngm.com/0609.



LAHINKO®



Every Shoe tells a Story

WE WEAR OUR HEARTS ON OUR SOLES

Shoes are the best indicator of how people are feeling," says Jane Brown, a shoe historian based in Northampton, England. "I have Swansall at my feet that tell me and tell of prosperity from the elevation of a heel; hear the distant rumblings of war in the configuration of a toe; measure social change by the thickness of a sole.

Every shoe tells a story. Shoes speak of status, gender (orality), ethnicity, religion, profession, and politics (the Russian writer Maxim Gorky said a strong pair of boots "will be of greater service for the ultimate triumph of socialism than ... black eyes"). Last, but not least, they can be deep, dark gargams

By Cathy Newman

PHOTOGRAPH BY MITCHELL FEINBERG

Photographs by Mitchell Feinberg

© JIMMY



Mule • Manolo Blahnik, pewter-colored silk with silver chinchilla rosette on vamp, 2005 (preceding pages)

High Heel • Manolo Blahnik, silk brocade with silver chinchilla and velvet ribbon, 2005 (left)

“It will never sell in London,” Manolo Blahnik sighs, cradling the silk-and-fur mule. “You know. The British. Animal rights. No foxhunting. No shooting birds. It is crazy.” He huffs. Looks hurt. “They won’t buy this shoe, *but*—they’ll eat rabbits and poor little animals like that.” There is a giggle like the splash of water in a fountain.

Politically correct or not, there is an irresistible urge to pet this shoe; put it on a leash; take it to bed. It is a Manolo Blahnik high heel, and for more than 30 years, Blahnik has designed shoes that are the accessory to a fairy tale: Shoes made of rhinestones, feathers, sequins, buttons, bows, beads, grommets, rings, chains, ribbons, silk brocade, bits of coral, lace, fur (from farm-raised animals, he adds), alligator, ostrich—everything, perhaps, but woven unicorn forelock.

Blahnik is a *rara avis* himself—an exotic hummingbird. He speaks in exclamation points. He will not sit still. He jumps up from the chair in his office with walls of dove-wing gray on King’s Road—a bird flushed from cover. He exclaims, enthuses—he is all flourishes, rococo gestures, exquisite manners; impossibly elegant, spotlessly groomed with silver hair combed straight back. There is the glen-plaid double-breasted suit, a purple-yellow-and-white knit tie, and—peeking out from the sleeve of a blue cotton shirt—a red crocodile band attached to a gold Swiss watch. The shoes are size 42 ½ buckskin oxfords made for him at his factory in Milan. “I dress like a banker,” he says when asked if the suit is custom-made. (It is.)

The story has been told before, “but”—he shrugs—“it is the only story I have.” After studying art and literature in Geneva, Blahnik fell in with the fashion crowd in New York and met Diana Vreeland, the legendary editor of *Vogue*. Vreeland looked at his sketches. Do accessories—pretty little things, she said airily. And so he has. A “Manolo” is the *Sex and the City* shoe (in one episode Carrie realized she could have made a down payment on a New York apartment for what she spent on shoes), a generic term for a high heel, and the inspiration for Madonna’s remark that his shoes are as good as sex, and “last longer.”

Ladies, listen. When Manolo dies, there will be no more Manolos. There is no heir or protégé. No big luxury goods conglomerate like LVMH waiting in the wings. No. No. No. When Blahnik has gone to that great shoe box in the sky, Manolos are finished. Done. Not for Manolo Blahnik a label without the real person behind it. Not like Christian Dior (died in 1957), Coco Chanel (1971), or Roger Vivier (1998), labels that survive under the aegis of others. Consider Salvatore Ferragamo (died in 1960) whose dynasty rests in the hands of his children and grandchildren. Blahnik darts off to fetch a photograph of the Italian who immigrated to California in 1914 and became shoemaker to the stars. The photograph shows Ferragamo, his big, broad face and broader smile, surrounded by the lasts of the actresses—Greta Garbo, Rita Hayworth, Sophia Loren—for whom he made shoes. “Look at that face,” he says. “He is a peasant! Brilliant. But a peasant!”

Ferragamo insisted style was not enough; shoes must be comfortable.

And Blahnik? What about complaints that his shoes are torture? “I haven’t heard that,” he responds. “Women tell me they love my shoes. Some never take them off.”

But isn’t a shoe really a corset for the foot?

“Yes. But a corset you *adore*.”

The mood shifts. Blahnik turns somber. The day before, an earthquake in Pakistan has killed 73,000, leaving uncounted injured, obliterating entire villages. The headlines weep tragedy. “I am embarrassed,” he says. “People are dying and I do these frivolous things.” The hand slaps his forehead as if in penance, then he opens a cupboard. There are six rows of shoes. They gleam like treasure. He lifts one out. “This one is inspired by Catherine the Great,” he explains, placing the shoe on the table for contemplation. It is a glorious fantasy of silk brocade, velvet ribbons, chinchilla: lush, powerful, yet fragile.

Still, it is pointed out, it is only a shoe.

Blahnik nods. “Yes, only a shoe, but if I provide escape for the woman who wears it, if for only a few minutes, it brings a bit of happiness to someone, well, then, perhaps, it is something more than a shoe.”

Sandal • Sagebrush bark fiber, Fort Rock Cave, Oregon, 8500 B.C.

Ease your hand gently along the insole of the sagebrush bark fiber sandal in the University of Oregon Museum of Natural and Cultural History, and you can feel the imprint of a big toe in what may be the world’s oldest existing example of footwear. The sandal, found in Fort Rock Cave in central Oregon in 1938, may be 10,500 years old, and was worn by a native North American who lived in caves during the winter months and hunted in marshes in summer.

“These are the traces of human lives,” says Tom Connolly, the museum’s research director. “The worn heel pockets on the sandals; the charred pinpricks on the toe flaps allow you to put yourself at a fireside. There’s the sense you get from an assemblage of sandals here, those big and worn, small and child-size, those caked in mud, that allows you to see them as products of real human families: mom, kids, dad, grandparents.”

Though humans may have wrapped their feet in skins earlier, Erik Trinkaus, an anthropologist at Washington University in St. Louis, says sturdy shoes originated between 40,000 and 26,000 years ago. Trinkaus studied the foot bones of Neandertals living 100,000 to 40,000 years ago, compared them with the more delicate foot bones of our ancestors living 26,000 years ago, and concludes that shoe wearers developed weaker toes because of the reduced stress and increased support footwear allows. From there, shoes evolved like stone tools and art, with other advances in human culture.

Jenna Tedrick Kuttruff, a textile expert at Louisiana State University, points out that of the group of fiber sandals (some as old as 8,000 years) found in a Missouri cave she has examined, no two are alike. “The wearers of these shoes lived a subsistence existence,” she says. “They didn’t need to make each pair different. But it’s human nature to make things visually appealing, to make one pair a little more complex than others to set it apart from someone else’s.” The desire to wear something different, distinctive, and decorative—that is to say, the instinct for fashion—has been around for a very long time.









Lace-up Boot • *Natacha Marro for the House of Harlot, 32-inch-high black leather with four-inch heel, 2000 (preceding pages)*

How is an in-your-face black leather thigh-high lace-up boot with a four-inch spike heel like a man's black calf lace-up oxford? They are both made on a last, the wood or plastic foot-shaped form that leather is stretched over and shaped to make a shoe. "You cut a pattern; you give it shape; you put on a sole," says Natacha Marro, a maker of custom fetish boots in London. "Really, they are both the same."

Marro learned shoemaking in London and started designing boots for films like *Star Wars* and pop stars like Christina Aguilera. Now she sells through the House of Harlot in North London, where an accessory is defined as a leather wristband with steel spikes.

This particular morning, Marro is wearing robin's-egg-blue Mary Jane wedges with a split toe that looks like nothing so much as a pig's trotter. "It's animalistic," she says. "I like animalistic."

Shoes are theater. "Shoes turn you into someone else. You can't be a dominatrix in a sneaker. If you are in a high heel, you are in pain, and you are going to make someone pay for it." Then there is the drag queen who puts on a high platform heel, and he becomes *she*. "You know women who will kill for the right shoe? There are men, too! You put on heels, and suddenly you are six inches higher," she says. "Who doesn't want to be six inches taller? Even men—more men than you can imagine—want to. It's a play. It's a power thing. You can dress as a sailor, a Victorian, a Renaissance princess. When I go to carnival in Venice, I put on my brocade high heels, and I am in the 17th century."

And the epitome of a sexy shoe is?

"You can't go wrong with a nice fitted black leather boot with a four-inch heel."

Or, maybe you can.

Space Boot • *ILC Dover prototype, stainless steel, Spectra, aluminum, polyester, 2003*

At \$30,000 a pair, moon boots make Manolos seem like cheap skates. Manolos wouldn't hack it in space. Moon walking demands the highest of high-tech shoes—like those designed by Dave Graziosi's team at ILC Dover, a manufacturer of space suits for NASA in Frederica, Delaware.

"We're planning for the moon and beyond," says Graziosi, an aerospace engineer. "Next stop: Mars." The latest in space footwear, the M2 Trekker, is constructed in three parts—an inner pressure bladder, a middle structural layer, and a protective cover.

The shoe will need to tolerate temperatures from minus 350°F to plus 350°F, resist micrometeoroids (at 45,000 miles an hour, even dust is destructive), hold up on the rocky surface of the moon, yet comfortably allow the wearer to hike back should the lunar rover conk out miles away from the landing module. The boot is slimmer and lighter than the last generation shoe worn by Apollo astronauts.

To be precise, the first man on the moon is myth—it was the first shoe

on the moon. Those shoes—Neil Armstrong’s boots (size 9½ medium)—are still on the moon, along with nine other pairs of boots worn during the Apollo missions. When the Apollo astronauts collected moon rocks, they had to jettison their boots to compensate for the additional weight they brought back. Three decades on the moon have taken a toll. The metal buckles and snaps on the boots would be fine. No oxygen on the moon, so no oxidation and rust. But the silicone soles and synthetic fabrics have probably off-gassed and degraded. Should anyone try to retrieve them, there’s a good chance the shoes would turn to powder if touched.

Platform Shoe • Vivienne Westwood, mock crocodile, 12-inch-high blue “staggerer” with satin ribbon, 1993

Gillion Carrara, a professor in the fashion department of the School of the Art Institute of Chicago, is demonstrating the anatomical effect of the high heel. “Look what happens when I put on a high heel,” she says, pulling on a Vivienne Westwood shoe. Westwood, the British designer responsible for the punk look, is famous for having brought supermodel Naomi Campbell to her knees when she sent Campbell down the runway in a pair of platform shoes so high that the supermodel stumbled and fell.

Carrara places the shoe on the floor, steps in and up. “The breasts go out; the derriere juts back; the leg elongates,” she says, as her anatomy puts her words into action. “Men find that very attractive.”

“The foot is an erotic organ and the shoe is its sexual covering,” wrote William A. Rossi, a podiatrist, in *The Sex Life of the Foot and Shoe*. “The shoe is the erotic foot’s pimp and procurer.”

Surely, it’s all those digits. Toe cleavage. Heaving arches.

“Wrong,” counters Harold Koda, curator of the Metropolitan Museum of Art’s Costume Institute. “The shoe isn’t the pimp for the foot. It’s the other way around. The foot is the pimp for the shoe. It’s the *shoe* that is the erotic object.” Cinderella’s glass slipper, not her foot, ignited the Prince’s ardor.

Feminist alert! The theme of helplessness runs rampant in the history of shoes—from Chinese foot-binding to the 21st-century stiletto. “I like high heels,” British photographer David Bailey reportedly said. “It means girls can’t run away from me.”

The needle-sharp heel called the stiletto, from the Italian word for “dagger,” appeared in the postwar years of the early 1950s. After the war and years of Rosie the Riveter masculine dress, fashion turned feminine; the focus turned to baby-making. Technology contributed a steel core allowing for a thin heel that lifted the shoe up like a skyscraper (previous heels, made of wood, could break). Voilà! The beautiful, dangerous stiletto stepped out.

In truth, we’ve been standing tall in shoes for centuries. Greek actors put on elevated platforms to raise them above mere mortal status. In 1595, Queen Elizabeth I authorized payment to her shoemaker for a “pair of Spanish leather shoes with high heels and arches.” In 15th- and 16th-century Spain and Italy, women wore exquisitely decorated shoes known as chopines, which could stand four inches or more off the ground. (An example in Venice’s Correr Museum is nearly 20 inches high.)

Beautiful? Yes.

Practical? Hardly.





To make the journey from point A to point B, the Venetian lady in chopines often had to be supported by servants. Each step hovered on the edge of disaster.

In one sense, chopines and high heels represent the grand folly of shoe evolution. “It’s as if you invented a practical item—say, toilet paper—then embedded it with bits of glass just to make it beautiful,” says one curator.

Or, as June Swann, the shoe historian, says, “It’s like the circus. You can learn to walk on anything if you put your mind to it.”

Man’s Shoe • *Leather, with hobnailed sole and heel, slashed, 1660-1669*

At first sight, the 17th-century leather shoe slashed into strips sent a chill through June Swann, then Keeper of the Boot and Shoe Collection at the Northampton Museum in England. The shoe, found in the eaves of an old farmhouse, was deliberately sliced into ribbons and hidden, but Swann doesn’t know why. “I do know it would take a carving knife to cut leather that thick and tough,” she says. “Someone worked hard to do that.”

Swann, 76 years old, face framed by a triangular wedge of white hair, walks around in size six Ecco sandals, and always carries a plastic bag with her shoe-inspecting tools—tape measure, flashlight, and magnifying glass. She is tart, opinionated (“Athletic shoes show how tolerant of ugliness we’ve become”), rigorous about scholarship, relentlessly intolerant of those who are not (“Her book is full of errors,” she says of a colleague. “On page seven it says—oh never mind—it’s rubbish!”). Museums around the world hire her to identify shoes in their collections, and Queen Elizabeth awarded her an MBE in 1976 for her work at the Northampton Museum. Swann doesn’t just read books for plot. She reads them for shoes. Madame Bovary’s lover gave her a pair of pink satin shoes trimmed in swan down. Jonathan Swift mentioned wood-soled shoes in *Gulliver’s Travels*. Recently, she saw a film version of *Pride and Prejudice* and noted with disapproval an Edwardian boot peeking out from an early 19th-century gown.

Manolo Blahnik doesn’t interest her. He’s “a decorator.” The subject of concealed shoes does, and has been a passion of hers since 1958, when someone brought her a pair of 1840s children’s ankle boots that had been found in a thatched roof.

“I worried about that pair of boots for a long time,” she recalls. “What parent would let a child play on a thatched roof? Why would they allow a good pair of shoes to be left behind?” When a colleague mentioned someone had brought him old shoes found beneath floorboards, the light clicked. Swann realized the shoes found in a thatched roof were put there intentionally. Since then, some 1,700 concealed shoes have been found—not just in Britain, but in Germany, Australia, Canada, the United States—and recorded in a registry started by Swann.

“Concealing shoes is tied up with superstition,” she says, “but I still don’t have the answers.” She hasn’t found any written explanations of the practice. No evidence, so no conclusions. As for the slashed leather shoe, it feels malevolent, provokes interesting scenarios (an unhappy wife? a disgruntled servant?), but remains a mystery.

Perhaps, suggests June Swann, the secret must remain one. Kept secrets have power. Revealed secrets have none.



Child's Shoes • *Bronzed, Germany, 1943*

Baby's Shoe • *Leather, Netherlands, 16th century (below)*

The shoes of the dead have a life all their own. When Elizabeth Semmelhack, curator at the Bata Shoe Museum in Toronto, first examined the brown leather 16th-century baby's shoe from the Netherlands, she had a revelation. "It was my epiphany shoe," she says. "I understood that I would never escape the wearer." Meaning she understood that the shoe was more than an object. A shoe—like a hat, or, to lesser extent, a glove—keeps the shape of and can conjure the person who owned it in a way that few possessions can. "When I held this baby's shoe, I thought to myself, Who was the kid who owned this? I realized it was something I would buy my daughter today."

Among other shoes in the collections of the Bata museum are a pair of bronzed child's shoes, and when asked why they were there (kitsch in a museum?), Semmelhack hesitates, puzzled herself. "Let's look," she says, lifting the identifying tag. She pales. "I see now," she says and gently replaces them on the shelf. "They are the shoes of a child who perished in Auschwitz."



Bespoke Man's Lace-up • Olga Berluti, from the
Warrior collection, brown calfskin with scar decoration, 1995

It is said that the men who belong to Olga Berluti's Swann Club polish their shoes with Venetian linen dipped in Dom Pérignon and expose them to the light of the full moon, but that is false. It is the *quarter* moon that is important, Berluti explains: "The moon gives transparency to leather. The sun burns; the moon burnishes."

More about the Swann Club (named for the protagonist of Proust's *Remembrance of Things Past*) later. For now, know that Olga Berluti is the creative director of, and designs handmade, exorbitantly expensive men's shoes for, the company that bears her family name.

Olga Berluti loves men's feet—a passion, not a fetish, she says. The passion began with her convent schooling in Italy. A long corridor led to the chapel and a 14th-century statue of Christ. "I would approach the altar," she remembers. "The nailed feet of Christ were exactly on the same level as my eyes. I stared and stared. I said to myself: When I am older, I will remove the nails. I will relieve the suffering of men's feet."

Berluti, small and slight with short black hair and eyes so dark they seem to be all pupil, does not seem tethered to the ground. She lives simply, does not eat meat and does not wear leather ("My life is flesh and blood already"). She wears only natural fibers—always white. On her feet: white cotton sneakers in summer, white wool shoes in winter. She is an ascetic in a universe of extravagance. "I sublimate myself. I suffer. I have spent my life at men's feet," says Olga, Our Lady of Shoes.

She speaks in Celtic rune and Delphic pronouncement. "Man is a vagabond deluxe. We are moving through to the perfection of gesture," she says. So what if the utterances make little sense. We are talking mystique and shoes with the chiaroscuro of a Caravaggio. We are talking shoes with the sleek, menacing profile of a mako shark, shoes decorated with piercings, tattoos, sometimes scars. They are shoes, she says, for the hidden warrior inside every man. Shoes, also, for the man with four to twelve thousand dollars to spend on a made-to-order dream.

Her atelier, in an 18th-century building in Paris's Marais, is a stage set. A shoemaker's bench with rows of apothecary bottles sits in the corner. Do the bottles contain essence of sorrow? Tincture of pain? No, merely fragrant oils and dyes. The lasts—she calls them *ex-votos*—of Berluti's famous clientele rest on low tables. There are lasts that belonged to Pablo Picasso ("We made his sandals"); Jean Cocteau ("He liked to wear shoes without socks"); Andy Warhol ("He asked for his right loafer to be patched—and be very visible").

Once a year Olga Berluti invites clients to the Swann Club soiree, a black-tie affair, with champagne, not just to drink, but to clean shoes. "The alcohol makes them shine, but it must be chilled; it must be a very dry, a grand champagne."

In Olga Berluti's world, the relationship between man and shoe is complex. "Shoes adopt and tame you, and you adopt and tame them, like domesticating a wild animal," she says. "You buy a pair of shoes you adore, but they are too edgy, too avant-garde. Perhaps your wife made you buy them. You put them away, and little by little this style, this color you're not used to seeps in. You buy a jacket that goes with them, or a different color





shirt. One day, you realize you have become the man your wife envisioned. The shoes revealed something new, something unexpected in you.”

But is not to take off one’s shoes to reveal something not so lovely, something, in fact, rather ugly—that is to say, one’s feet? The writer offers her own as an example.

Olga Berluti does not flinch. She reaches to cradle the feet. “No, no,” she says passionately. “There are no ugly feet. Feet are spiritual. They enable man to stand up. They free his hands. Now, he can look at the stars.”

Moccasin • Sioux, beaded sole, 1880 to 1900

“Shoes proclaim what it is you don’t have to do,” Elizabeth Semmelhack says. “That’s why Manolo Blahniks are called limousine shoes.” Next, Semmelhack shows off a pair of 19th-century Sioux moccasins. Exquisite beadwork covers the soles. The limousine principle applies here, too, except that the wealth proclaimed was horse wealth. The beaded soles telegraphed a Sioux variation on a theme of upmanship: *I don’t have to walk. I can ride. Furthermore, you who aren’t on a horse can see from the soles of my moccasins just how well off I am.*

Fast-forward to Diana Vreeland, the *Vogue* editor, who kept the soles of her shoes polished to a perfect sheen, the implication being that her shoes were not for anything as pedestrian as walking. It was fashionspeak for *I don’t have to pound the pavement. Driver, come here.*

In an apartment on the Upper East Side of Manhattan, Nancy Knox opens her closet to reveal boxes and boxes of shoes by Jimmy Choo, Patrick Cox, Christian Louboutin, Gucci, JP Tod’s, Manolo Blahnik, Philippe Model, Issey Miyake, Maud Frizon, but the *crème de la crème*, the *ne plus ultra* of her collection is a pair of Roger Vivier heels bought 20 years ago on Madison Avenue. They are crimson suede with brass comma-shaped heels that rat-a-tat-tat like the report of a firing squad as she crosses the parquet floor of her apartment. “Devil shoes” she calls them, and you can imagine the dark, leering glances of men and a whiff of brimstone.

What is it about shoes? She reaches for an answer. “Make you feel good? Better than sex?”

The question persists. Joan Rivers aside (“Does fashion matter? Always—though not quite as much after death,” she said), fashion is frivolous.

Yet, it is not. “Should we be silent and not speak, our raiment . . . would [betray] what life we have led,” Shakespeare wrote. And so it is with shoes.


Joanne Heaney, thirtysomething winner of a shoe-aholic contest run by a Canadian chain of shoe stores, lives in Toronto and carries photographs of her favorite shoes in her wallet. “I have about 200 pairs,” she says. “My fancy shoes are in my closet. Summer shoes are in another room. Winter shoes are in the basement.

“Why shoes? They fit if you gain or lose weight. They make me feel pretty. They make me feel sexy. They’re a great antidepressant. I don’t have a pet or a boyfriend. I have my shoes.”

Shoes are armor—protecting us from the flinty surface of the moon, the searing sand of desert, the urban grime of city asphalt. Shoes also reveal our vulnerability—not just the weakness of vanity, but the easily wounded nature of our souls. □



Struggling against a powerful current, Robbie Shone pushes through the pain as he crosses a river in Ora Cave on New Britain Island. Shone had broken a rib earlier while cutting trail through the rain forest to explore one of Earth's most remote underground rivers.



Raging danger

Surviving white water below Papua New Guinea's jungle





The crash of rapids surrounds expedition leader David Gill, left, and Herb Langer near the entrance of Ora Cave. Hot acidic waters welling up from deep underground, combined with drainage from heavy rains, have carved a maze of tunnels and chambers through New Britain's young limestone.





A ribbon of water bursts from Mageni Cave (top) and other passages, plunging 260 feet into the unexplored Iso River Gorge. The team found Mageni by chance while flying over the forest. To reach it, they rappelled to a ledge then hacked a path along a sheer wall. "It was a dodgy traverse," says Shone. "Most of our anchors pulled out."

By Neil Shea NATIONAL GEOGRAPHIC WRITER
Photographs by Stephen L. Alvarez

White water is fearsome enough on the surface. Pour a river into light-swallowing limestone tunnels and it becomes terrifying.

Deep beneath the rain forests of New Britain, an island off the coast of Papua New Guinea, churning rapids jet through enormous passages, some of the largest, most remote river caves on the planet. To reach them, explorers must first descend into massive dolines—sinkholes where soluble rock, weakened by runoff from an estimated 18 feet of rainfall a year, has collapsed. From the air they appear like impact craters, as if a volley of meteorites had long ago pummeled the forest.

“It’s frightening when you see one—it’s just a mass of white water at the bottom of a dangerous hole,” says David Gill, a British caver.

An electrical engineer by trade, Gill taught himself to cave in the wet, cold potholes and the abandoned lead mines of Derbyshire in the English Midlands. Twenty-two years ago, he led a team to a doline called Nare in New Britain’s Nakanai Mountains, where he first beheld the crushing beauty of river caves.

In January, Gill returned to the Nakanai, with

11 adventurers from the U.K., France, and the United States, on a two-month expedition to plumb one of the island’s largest dolines, a half-mile-wide bowl called Ora.

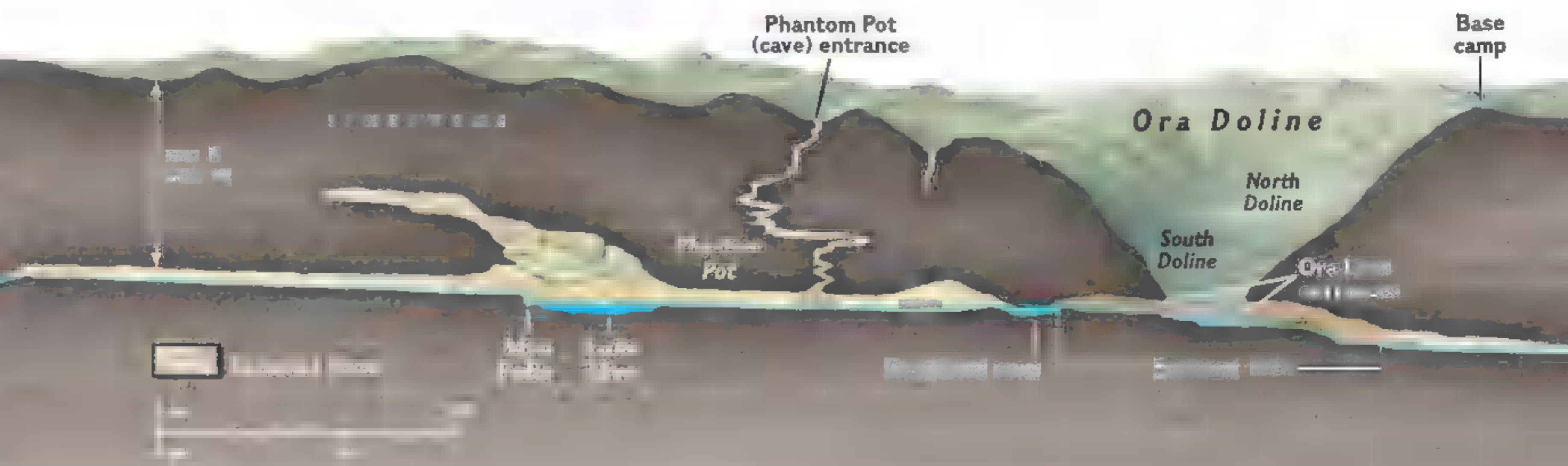
The team’s goal: To push deep into the cave at the bottom of Ora, map its enormous chambers, and follow the river boring through it—to the very end if possible.

“It’s very, very remote,” says Gill. “The terrain is so difficult. You can’t hike in a straight line, and it’s totally unexplored. Even the local people don’t go up there. There’s nothing there for them.”

From Port Moresby, capital of Papua New Guinea, the men traveled by plane and boat to Matong, a shore camp for loggers on New Britain. Then lumber trucks hauled them to another camp, where the roads disappeared. A helicopter dropped them at a small settlement inhabited by a hundred members of the Kol people and two families of missionaries from the U.S. and Australia.

At first, villagers suspected the outsiders were gold hunters. A few even pulled team members aside to show off the yellow lumps they’d found.

In a roadless land, a helicopter ferried the team’s supplies, three tons of food and gear, to a village named Ora, home to the Kol people. Villagers helped haul the load to a camp overlooking the Ora Doline.



From Sinkholes to Waterfalls

Some of the world’s largest sinkholes, also called dolines, plunge into the karst terrain of New Britain (map). In Ora Cave, the team followed the river as it tumbled through passages the size of subway tunnels. They also discovered two other major caves, Phantom Pot and Mageni, where cavers surveyed four miles of tunnels, climbed four waterfalls, and found luminous limestone curtains. Near the expedition’s end, the team spotted a previously unknown doline about 12 miles west of Ora.



ART ■ MATTHEW FREY
 CAVE PROFILE BY ROBBIE SHONE AND DAVE NIXON
 NGM MAPS



“We’d just say, ‘Oh yeah, fool’s gold,’” says Dave Nixon, 38. “It’s hard to explain that gold deposits don’t occur in limestone.”

The community soon warmed, and most villagers agreed to work as porters hauling supplies to base camp, a three-hour trek to a ridge overlooking the Ora Doline. Then the rain began, weeks of it, transforming the forest into a gleaming, mud-slick obstacle course.

At the bottom of the doline, the explorers followed the river into one side of the cave, then the other, hugging the narrow riverbanks underground, the water rumbling like a freight train. Often the banks disappeared, forcing the men to cross the river using ropes—a dangerous traverse where one caver would swim across, water boiling over him, to fix a line for the others.

Jean-Paul Sounier volunteered for most of the

swimming. Sounier, 55, has been caving for 40 years and made five previous pilgrimages to caves below the Nakanai.

“You can’t afford an accident,” he says. “It’s not like home where if you have an injury, a rescue team will be quick to get you out.” On New Britain, there was no rescue team.

Ora’s upstream cave (map, pages 100-101) eventually opened into a massive cathedral, where a vaulted ceiling soared more than a hundred feet above a deep, turquoise lake. The downstream cave dead-ended after a third of a mile in a rock-filled sump where the river drained back into the earth.

In a connecting cave called Phantom Pot, the explorers crawled through a tight, sinuous passage lined with skin-ripping rock. Each journey into Phantom required a four-hour ordeal in the cheese grater—two hours each way. Then, back at the surface, the men slogged uphill to camp, sometimes in rain, sometimes in darkness, a

Society Grant This Expeditions Council project was supported by your Society membership.



“You can’t afford an accident. It’s not like home where if you have an injury, a rescue team will be quick to get you out.”



chorus of frogs and insects whirring in the trees.

“We’re quite masochistic,” says Dave Nixon, laughing. “But it’s character-building stuff.”


In the end, the team discovered nearly eight miles of river caves. Gill hopes the expedition’s work will help persuade the Papua New Guinea government to create a conservation area protecting the Nakanai Mountains. The Malaysian government did something similar on Borneo—with instrumental guidance from Gill—at Gunung Buda, another region of giant caves, which was declared a national park in 2001.

“The thrill of exploring where nobody has ever been before, of being the first light to ever shine in the darkness . . . it’s awe-inspiring,” Gill says. “The world of caves remains relatively untouched. It is the ultimate adventure.”

Thick vegetation calls for sharp tools (left) on the three-hour trek from village to camp. Relentless rain, mud, and mosquitoes made for rough living conditions during the two-month expedition. Tea, Spam, and British humor kept exhausted cavers going through 18-hour days. Above Mageni Cave, Dave Nixon beckons for room service from photographer Stephen Alvarez. “I was saying, ‘Put that camera down and put the kettle on.’”


Deep Down Follow photographer Stephen Alvarez into one of the island’s great unexplored caves in ■ multimedia show at ngm.com/0609.



A person wearing a bright yellow jacket, blue pants, and a white helmet is crossing a waterfall. The person is positioned on a narrow ledge of the waterfall, with their arms outstretched for balance. The waterfall is surrounded by dense, lush green vegetation, including large ferns and other tropical plants. The water is white and turbulent as it falls. The scene is set in a dark, dense jungle environment.


White thunder explodes around James Alker as he steps across the Ora Waterfall, where the river gushes back into daylight. With few places to pool on the surface, New Britain's rainforest rains drain underground, gathering into powerful rivers.





Water torture: Dave Nixon hauls himself up the 33-foot Myo Falls above Lake Myo. The ascent required Nixon, also suffering from a broken rib, to battle his way up crumbly rock under a chilling spray. It took nearly two and a half hours. "There's incredible noise, it's cold. You don't want to be there too long," he says.



A large, dark cave chamber with a person standing on a ledge on the left and another person wading through water in the foreground, illuminated by a headlamp.

A photographer's flash briefly reveals Lake Myo's turquoise depths and the chamber's incredible scale—nearly 450 feet long and 164 feet high. Above Myo Falls, left, the cave wound on for half a mile before the team stopped at a water-filled tunnel. Navigating by headlamp, the explorers rarely saw the cave's full splendor. "You're watching the floor most of the time," says David Gill. "You're only scrubbing away the darkness." □

KILLER PRIDE

A DANCE OF DEATH LINKS LIONS AND BUFFALO



Supremely muscled from hunting Cape buffalo, a lioness grudgingly retreats from a wall of scimitar

IN BOTSWANA'S OKAVANGO DELTA



horns as the herd returns in force to try to rescue ■ wounded bull.

By Dereck Joubert

Photographs by Beverly Joubert

Lions usually hunt at night, or at least in the cool hours of dawn and dusk. But when the midday heat climbs to 120°F, the lions of Duba Plains are just starting to stalk their prey. It's one of many uncommon traits of a pride of lions that lives in an intimate relationship with a herd of Cape buffalo on a marshy island in the Okavango Delta. The nine lionesses of the Tsaro pride (*tsaro* is the local name of the palms they like to rest under) rarely let the herd out of their sight, and attack this ready meat supply with little of the usual lioness stealth.



When hunting, they run directly at their prey. Each month the lions kill about 22 members of the resilient herd that numbers more than a thousand.

Painted with the blood of a hard-won meal, this lioness (right) pauses to make sure the

herd isn't going to rally. Cape buffalo are always formidable prey, but, surprisingly, the Duba herd has learned to fight back as a unit. Buffalo returned the cats' aggression in more than three-quarters of the hunts we observed during two years at Duba, sometimes fatally injuring the lionesses. The buffalo are capable of fleeing the island, especially during the dry season, when the surrounding rivers are fordable. But they stay, the strategy seeming to be: Better the enemy you know.

Beverly and Dereck Joubert also tell this African drama in their National Geographic Channel film *Relentless Enemies* and in their new Geographic book of the same title.





The pride begins a hunt with seeming nonchalance, scanning for easy victims as panic starts to spread (below). The lions break into a run, and the herd stampedes. Sometimes it looks as if the lions are completely in charge, knocking down and killing even a large buffalo within five minutes. Other times the struggle can last seven hours—an intricate tango in the wild, with the cats probing for weakness and the buffalo countering with slashing hooves and swinging horns. The pride works as a team, watching for missteps as the prey wearies under the pressure of assault.







It takes enormous strength to charge through water. The lionesses of the Tsaro pride develop weight-lifter physiques by daily pursuing buffalo—their sole prey—through marshy terrain. Lions do not take naturally to water, but at Duba they’ve become swamp cats. Two other prides, each with a slightly different hunting style, share the 80-square-mile island, which shrinks by almost half in the wet season. But they aren’t as bound to the herd as are the Tsaro lionesses, which can sleep in plain sight of the buffalo without causing alarm.





A 380-pound lioness launches onto the back of a bucking cow. The cat is momentarily thrown, and



other buffalo press in to help. But another lion leaps on, then another, and soon the cow is downed.



The last breath of a day-old calf ends in ■ paralyzing grip. A flood of calves born from November to



March provides a feast the lions can't keep up with, and enough young survive to increase the herd.

Field Time Watch a video interview with Beverly and Dereck Joubert, and download the Duba lions as wallpaper at ngm.com/0609. See more of Botswana's wildlife in action at ngm.com/wildcamafrika.



Growling their reluctance to cross a river where crocodiles lurk, a group locally called the Pantry pride show their scars. Once as numerous as the Tsaro pride, they ruled the eastern edge of Duba, attacking buffalo with abandon. One lioness felled a bull after clinging to his throat for almost an hour, even as another bull repeatedly charged and hit her broadside. But fearlessness took its toll. Lion after lion from this pride died by hoof or horn, and now only two remain. For any of Duba's uncommonly bold lionesses, each dance with the herd could be her last. □



SONGS OF THE



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SONORAN

A DESERT CAN FOOL THE EYE.

A SUN-BLASTED PLAIN OF DEATH TURNS SUDDENLY

INTO A LANDSCAPE OF SOUND, WATER, AND LIFE.





Relic of an ancient cataclysm, the Cerro Colorado volcano lies dormant in Mexico's Pinacate.





Blue-footed boobies nest beneath the corpse of a cardon cactus on Isla San Pedro Mártir.





Bighorn sheep find a rare dry-season pool in a shadowed crack of Arizona's Tinajas Altas range.

By Douglas H. Chadwick
Photographs by George Steinmetz

If the Sonoran Desert's a wasteland, why is the vegetation so thick that it's nearly impossible to see over, much less walk through unpoked? If life here has been sun-blasted to a minimum, why are the sandy washes scribbled with footprints from javelinas, mule deer, ringtails, and so many rodents that as many as 200 rattlers a square mile can make their living with a sit-and-wait hunting technique?

This seems to be an ecosystem in need of a public relations makeover. Yes, the Sonoran Desert does get parched and hot as hell. But its emblem, that saguaro standing with upraised arms, is not some lonely perch for vultures in the barrens but part of a forest of storage tanks juicy with life.

Within hours of a rain, many will be spreading new rootlets to harvest the drops. The plants' accordion-like structure lets them swell with extra liquid, as a Gila monster's extra-large bladder is designed to do, while it packs away food reserves in its expandable tail. During May and June, the driest months, when winter's rains have been all but forgotten by most, the saguaro and its even bigger southern counterpart, the cardon cactus, crown themselves with extravagant, white, nectar-filled blossoms. These nourish birds, insects, and especially bats, and are pollinated in return. The flowers then develop into succulent fruits, supplying meals and moisture to a still broader array of creatures, from iguanas to kit foxes, until the summer thundershowers begin. Retiring to one of the many small trees that also characterize this desert, such as yellow paloverde, blue paloverde, catclaw acacia, ironwood, or honey mesquite, to rest and digest, the animals leave droppings full of seeds exactly where a saguaro or cardon needs to grow during its tender years: in the shade of a nurse plant. If life here is just hanging on by a thread, how is it that a saguaro may produce millions of seeds a year and live to be 250 years old?

With few winter frosts and dual rainy seasons half a year apart, the Sonoran region supports such a rich variety of flora and fauna that it seems almost lush compared with other deserts.

In some experts' view, it isn't really a desert so much as a drier version of the subtropical thornscrub found farther south in Mexico. However you define the Sonoran ecosystem, it is a spectacular illustration of how communities of organisms facing extreme conditions find ways not merely to endure but to flourish.

A good place to rest, this fold of shade at the arroyo's steep edge, and a good place to ponder. Two days ago, a July cloudburst dropped an inch of rain here in Arizona's Saguaro National Park. Water is still seeping down the arroyo and collecting in pools. Bright green algae already coat the bottoms. Mourning doves, cactus wrens, and hundreds of bees sip from the edges. And somehow, among these mountainsides of stones too hot to touch, tadpoles have materialized within the pools. Native Americans who paused beneath the same rock wall long ago left paintings of humans, creatures, and spirits. If, as it seems, the figures are keeping watch, they have witnessed many times before the drama of survival that is about to play out.

Many frogs and toads need months to develop from eggs into adult form. Spadefoots, which are similar to true toads but have smooth skin, catlike eyes, teeth, and a sharp nail on the hind feet, live by different rules. Adults exist in a dormant condition buried beneath the desert floor like plant

bulbs until they sense vibrations from thunder and raindrops. Then they emerge to gather at runoff pools, send ear-splitting choruses into the night, and breed. With metabolisms set on fast-forward, the offspring can transform into miniature grown-ups in as few as eight days. The race is on to become an air-breather hopping about and fattening on insects before the pond dries, leaving the moist-skinned amphibians no choice except to spade back underground and wait for another heavy rain. That might be months. It might be more than a year.

If the tadpoles in the arroyo pools are red-spotted toads, usually found around more permanent water, they're doomed. If they're spadefoots, they have a chance. Every day, they grow a little larger. Every day, the pools are smaller, vaporizing under the midday sun. . . .

"A year ago this month, she was on death's door. Skin draped over a skeleton. Out moving all the time, got to find food. But there was

none," says Jon Davis, a graduate student from Arizona State University. "I wanted to take her in, I was so sure she would die." In the light of our headlamps, a 15-inch Gila monster, firmly held behind the jaw, dangles like a toy dragon covered with pink and black beadwork. The belly is wide, the wriggling tail plump as Polish sausage. We can see baby rabbit fur stuck to the mouth. Life for this reptile is plainly on the upswing. Davis pulls a couple of cactus spines from the female's toes and puts her in a bag for closer inspection by daylight.

Rising with the calls of doves and quail before dawn, he reaches in to grab the animal and scan her with a portable ultrasound unit. A wake-up cup of coffee first is a good idea; the Gila and its closest kin, the Mexican beaded lizard, are both venomous, and their bites can cause severe pain, faintness, or worse. An image of the animal's bladder appears on the screen. This organ has banked a fortune in water, the currency of the

Spadefoots mate in a puddle in Vekol Valley, Arizona, during summer rains. To survive, tadpoles must grow into toadlets quickly and then dig deep burrows to escape the desert's inferno—until the next rains summon them to repeat the cycle.



100,000 SQUARE MILES OF DIVERSITY

The Sonoran Desert supports some 2,000 plant species—the most among North America’s major deserts (inset below). Yet this sprawling landscape is really a collection of distinct biotic communities, each fostering its own blend of flora.



Lower Colorado River Valley
Dotted with creosote bushes, these valleys include some of the Sonoran’s driest lands.



Arizona Upland
Giant saguaros tend to grow on hillsides here — the valleys often freeze.



Vizcaíno
Moist Pacific air helps cloak this part of Baja in fog and feed unusual plants like the boojum.



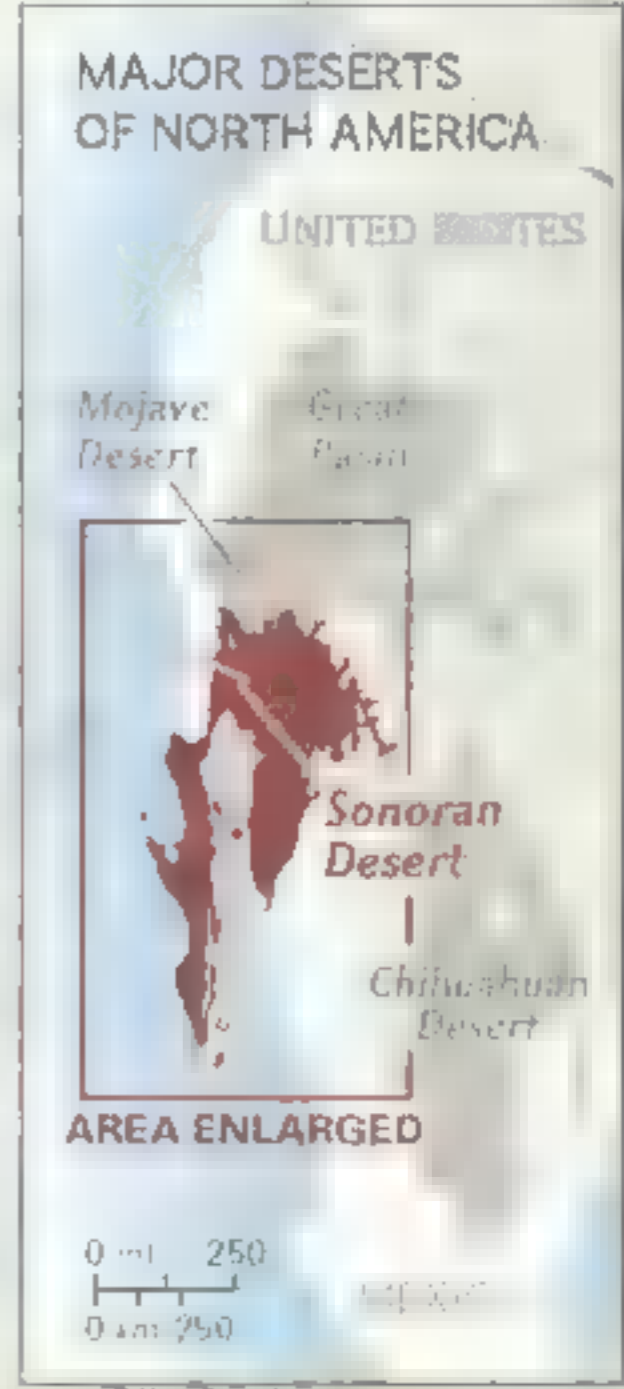
Plains of Sonora
Flat terrain and good soil nourish a wide range of trees here, notably thick stands of mesquite.



Central Gulf Coast
Dominated by drought-resistant cactuses, such as the cardon, the region can go years without rain.



Magdalena
Similar to the Vizcaíno, it gets less fog, which suits colonies of creeping devil cactuses.



ART BY MATTHEW FREY
SOURCES: MARK DIMMITT, ARIZONA-SONORA DESERT MUSEUM, MAP DATA FROM FORREST SHREVE, MODIFIED BY DAVID E. BROWN, THOMAS BRENNAN, AND PETER LINMACK, ARIZONA STATE UNIVERSITY, MEGHAN M. KIEFFER AND LISA R. RITTER, NGM MAPS

Sonoran Desert ecosystem. "Gilas can drink enough in one day to boost their body weight 20 percent," he tells me. "Just like that, they'll go from looking awful to looking great. This is the kind of year that gets everybody through."

Spanning 100,000 square miles, the Sonoran Desert encompasses southeasternmost California, southwestern Arizona, at least half the Mexican state of Sonora, and nearly all of the Baja California peninsula. Although some sections average barely 3 inches of rain yearly, others see 10 to 12, more than parts of Wyoming. Winter storm systems from the Pacific typically supply about half the annual total, but the winter of 2004-05 brought record deluges, breaking the grip of a several-year drought. By spring, the region looked and smelled like a florists' convention. Even plants no one had seen for decades erupted from long-patient seeds. Then summer came. The thermometer hit 100°F or more for 39 straight days in Tucson. Phoenix recorded afternoons of 115° and more than two dozen heat-related deaths. Heatstroke and dehydration were killing at least that many illegal immigrants from Mexico monthly as they trekked north through remote Arizona borderlands.

Lowest and warmest of North America's four major deserts (the others being the Mojave, Great Basin, and Chihuahuan), the Sonoran is also the only one with two distinct rainy seasons. That tremendous summer heat rising off the countryside draws moist air from the Gulf of California and occasionally the Gulf of Mexico. Thunderclouds take over the blazing sky many afternoons, delivering intense downpours, complete with flash floods. The monsoons, as locals call the hot season storms, were late this year. But they have arrived, slaking thirsts and spurring another round of plant growth. Which means more births among rabbits, rodents, and birds, whose young are all favorite meals of the Gila monster. It may eat enough at one nest to increase its weight as much as 50 percent, then retire to its burrow for a week or more. A hormone recently discovered in the monsters' venomous saliva may help regulate this on-and-off

pattern of activity. In 2005, a synthetic version of the chemical won approval as a drug that has proved very effective in controlling type 2 diabetes. It could aid patients in losing weight at the same time.

Davis has spent three years tracking Gilas implanted with radio transmitters and miniature temperature recorders. His study site near Picacho Peak State Park, northwest of Tucson, samples a single square mile of Sonoran Desert. It contains at least two dozen Gilas. In an adjoining square mile, another reptile researcher estimates the western diamondback rattlesnake population at 200. That's not counting the tiger rattlers, Mojave rattlers, and sidewinders. A lot of Sonoran wildlife shifts to nighttime activity in summer to cope with the heat, and while tracking Gilas under the stars, we often come upon diamondbacks. Each rests in a motionless coil, scanning the darkness with infrared sensors in pits on its face, until a kangaroo rat or pocket mouse happens by. Scorpions and tarantulas scuttle underfoot as we ease past cactuses furry with long spines. One careless moment, and you jump back with pieces pinned to your hide. Meet teddy bear cholla, possibly the worst-named, least cuddly plant in the world.

One by one, the pools vanish. Shriveled tadpole bodies cover the pebbles like tar. Where a few puddles no bigger than a dinner plate persist near the source of the seep, so do squirming masses of young amphibians, their bodies still growing, backs breaking the surface at times. Although great, luminous clouds billow overhead most afternoons, the showers they yield are spotty. Finally, it does rain on the mountainside. Not much; just enough to swell the pools a fraction. . . .

Even in early May, this desert can draw three gallons of water out through your skin in a day. But if the region is so arid, why are there angel-fish swimming with me and curious sea lions swooping by? Half of the Sonoran ecosystem lies within 50 miles . . . (Continued on page 140)





Once lush with grasslands, the Colorado River Delta is now starved of water by upstream dams.





Often chaotic, always cacophonous, Isla Raza is the breeding ground for nearly all elegant terns.

A spiny-tailed iguana nibbles a cardon cactus flower on Isla San Esteban. The Seri Indians considered these reptiles ■ valuable food source and spread them among several islands in the Gulf of California to serve as emergency stores for stranded fishermen.

of a sea. Salt water surrounds one of the most fascinating portions, which takes in nearly all of the 34 major islands and more than 850 smaller islands and islets in the Gulf of California. Some have labeled this archipelago Galápagos North because so many different species arose from common ancestors as they adapted to island environments, providing a laboratory for the study of evolution.

Steep-sided Isla San Pedro Mártir, a square mile in size, towers among the remote Midriff Islands at the center of the gulf, shimmering ghostly white from guano, blurred by a haze of wings, and moated by cold, upwelling currents where great whales feed on krill and sardines. Large birds, including the world's densest colony of brown boobies and largest colony of blue-footed boobies, rule this strange castle alongside side-blotched lizards, which abound almost a thousand to an acre. The court jesters are striped gnats known as *bobitos*, or little boobies.

While gnat larvae develop in the boobies' droppings, adults sip moist mucus from the birds' eyelids. They're happy to drink around your eyes, too. And in your ears, up your nose, or on any patch of sweaty skin—by the hundreds, tickling without letup. The green-and-turquoise lizards, *Uta palmeri*, found only on San Pedro Mártir, are almost as bold. Show a bit of red on your sock, and a dozen emerge from rocks to run up your leg and bite the cloth. Red happens to be the color of a key *Uta* food: fruit from cardon cactuses, which grow in candelabra forests fertilized by the bird lime. The lizards also dash right in among the birds to snatch fish scraps and gnats.

There are 115 kinds of land-dwelling reptiles on the gulf's islands. Forty-eight of them are unique to this region. For example, the Midriff island called San Esteban has produced a rattlesnake, whipsnake, spiny iguana, and Gila monster-size chuckwalla, all found only within its 16 square miles.

Ana Luisa Figueroa of the Mexican resource agency CONANP (Comisión Nacional de Áreas

Naturales Protegidas) urged me to add this: By all means, go see the wonders of the gulf's isles. But do it with a guide or, better yet, from a boat circling the shores. The birds nest so close together that a single hiker can put thousands to flight. Before that blizzard settles down, every exposed egg or young chick will have been eaten by gulls or ravens.

Many of the gulf islands have native *Peromyscus* mice. Many host the endemic Mexican fishing bat. But hardly any hold larger predatory native mammals. After seeing me off on my snorkel along San Pedro Mártir's shore, Araceli Samaniego, a biologist with the Mexican nonprofit Grupo de Ecología y Conservación de Islas, part of a North American island conservation network, scrambled up steep cliffs where she noticed a dwindling colony of red-billed tropicbirds nesting. She returned fuming, carrying crab shells and infant bird bones, all gnawed. "Rats," she grumbled. "Everywhere!" House mice—*Mus musculus*—and cats, too, often jump ship to take up island life.

At each island we visit, Samaniego sets out a series of baited live traps. A petite, soft-spoken woman of 28 with an easy laugh, she talks to the wild mice she catches, calling them *corazón*—sweetheart—and stroking their little feet before letting them go. If the traps hold rats instead, she carefully weighs and measures them. Then she kills them. She doesn't like it, but she likes the idea of rats gobbling nestlings and rare endemic life-forms even less. Two-thirds of all known extinctions worldwide since the year 1600 have taken place on islands, Samaniego reminds me, and alien species introduced by people are a major cause.

Gathering data by trapping is the early stage of a planned effort by the island conservation group and CONANP to eradicate rats on San Pedro Mártir. A similar program on nearby Isla Raza in 1995 helped restore the globe's premier breeding colonies of elegant terns and Heermann's gulls, though it came too late for the island's nesting black storm-petrels and Xantus's murrelets.







A crouching cougar sets off a camera trap at ■ spring in Organ Pipe Cactus National Monument.

The arroyo has exactly three pools with huddled tadpoles left. Another shower swept the mountainside last evening; too brief to expand the pools, it at least replenished the trickle that sustains them. Other life-forms are growing and changing on all sides. Having turned entire slopes yellow with blossoms in spring then withered into lifeless-looking bundles of twigs, the brittlebush is going green again. Ocotillos on the banks sport new leaves. Wildflowers tint the shade, conducting business not just with honeybees but also with burly carpenter bees that drill into woody plant stalks to build brood chambers for their larvae, and with tiny, emerald, stingless bees that live a solitary existence. An entomologist in Tucson, Steve Buchmann, thinks the Sonoran ecosystem may support the greatest diversity of bees anywhere—around 500 species. Why not? Plants of one kind or another are in bloom almost every day of the year. As temperatures soar dangerously high, honeybees literally keep a cool head by

extruding a water droplet from their mouth to shed heat by evaporation.

The afternoon is hotter by the hour. Yet even as some of the tadpoles trapped in cracks thrash half exposed to the air, new ranks of thunderclouds are forming not far to the south. . . .

In 1993, 2,760 square miles of Mexican mainland near the head of the gulf were declared the Pinacate and Grand Altar Desert Biosphere Reserve. The Desierto de Altar segment holds North America's most extensive dunes—finally, a setting that matches the Sonoran Desert stereotype. The sands are shavings off landscapes like the Grand Canyon and snowy peaks of the Rockies, swept downstream by the Colorado River, deposited in its delta on the gulf, and carried here by winds. In the adjoining Pinacate segment to the east, magma surging from the Earth's mantle blew the place up, repeatedly, leaving 400 cinder cones and ten massive craters to explore.

A giant hairy, one of some two dozen Sonoran scorpion species, stings its prey—another scorpion. Big enough to kill lizards, giant hairies spend the day underground. Scientists spot them at night using ultraviolet light, which causes their bodies to fluoresce.



At twilight, the reserve's biologist, Eugenio Larios, leads the way through labyrinths of jagged-edged lava. You fall, you bleed. Each step echoes below in tubular caves. A mile ahead waits the entrance to one tunnel whose interior is the daytime maternity roost for about 150,000 lesser long-nosed bats. Leaving their young clinging to the walls, the mothers fly out each night to lap cactus nectar, sometimes venturing many miles into Arizona before dawn. They are nearing the end of a yearly migration from south to north through habitats with flowering cactuses—a nectar corridor from Central Mexico to southern Arizona.

At dark, a torrent of winged mammals issues from the once molten ground. The cavern's breath drawn out in their wake is rank but soft with moisture. Bats rely on such humidity to temper Sonoran summer conditions, just as other mammals seek the refuge of damp burrows by day. After sitting a while, I lay one leg flat, and something strikes my calf like a hot needle. My headlamp beam spotlights a scorpion—a small, slender one. They're supposed to be the worst. We're a world away from a hospital. I ask Eugenio what to expect. He tells me that some people come out OK. And the others? He mimics keeling over, then shrugs.

Within minutes, I feel my heart beating too fast and a cold sweat on my skin. So I lie on the stone, elevate my foot, and wait for whatever comes next. Moonrise illuminates a distant mountain range to the south. A pocket mouse appears beside me, gathering dried grass seeds. Around a boulder comes a pinacate beetle, dark as the lava. When threatened, this insect lowers its head to point its abdomen skyward, ready to discharge foul-smelling, oily defensive chemicals. The indigenous Tohono O'odham say the pinacate beetle puts its head down out of shame because when its ancestor was given a load of stars to arrange in the sky, it tripped and spilled them. Above me is the result: the Milky Way, contending with the moon for brilliance. In an infinite universe stuffed with marvels, my own significance hardly seems worth fretting over.

And after a while, it's apparent that the venom isn't affecting me anyway. My symptoms were from a flush of fear. I feel more alive than ever.

Couch's spadefoot tadpoles have been growing in the water trapped by a small rock pit near a roadside. Two days ago, they sprouted arms and webbed feet. Newly minted mini-adults are basking on the rim this morning. My afternoon trek up the arroyo is rewarding as well. Three pools persist, and so do clusters of tadpoles within them. . . .

The Sonoran pronghorn never asked for much water. Unlike northern pronghorn, this desert subspecies gets almost all the moisture it needs in dry times from vegetation such as the pulpy ends of chain fruit chollas. Still, the population had been on the decline for decades. Sonora, Mexico, supported about 500. Another 150 lived north of the border, mainly in Arizona's 330,000-acre Organ Pipe Cactus National Monument and 860,000-acre Cabeza Prieta National Wildlife Refuge immediately to the west. Then, after several thirsty years in a row, the rains of 2001-02 failed almost completely. By late summer of 2002, the U.S. pronghorn population totaled 19, vying with Florida panthers and mountain caribou for the role of the nation's most endangered large mammal.

Historically, these desert antelope could always retreat during severe drought to the Colorado River system or east to the Santa Cruz River and its tributaries. People forget that 19th-century trappers caught beavers and otters in streams shaded by ash, oak, cottonwood, and sycamore where only hot sand runs today. Ever increasing numbers of wells sunk into underlying aquifers have dramatically lowered water tables in the region. Excessive livestock grazing stripped away moisture-retaining riparian, or streamside, vegetation. So much surface water is siphoned off upstream for urban and agricultural use that the mighty Colorado's discharge into the Gulf of California has shrunk to dribbles of chemical-laden soup. And all the while,





Stiff Pacific winds sweep a field of barchan dunes toward Laguna Ojo de Liebre.

A boojum gracefully bows toward the desert floor, as if to offer its flowers back to the earth. Millions of these strange succulents dot central Baja California, living from rain to rain, as have the inhabitants of the Sonoran Desert for millennia.

fences and other barriers, especially highways, discourage the shy pronghorn from migrating in search of what water and forage remain.

"We had a sample of nine pronghorn wearing radio collars in 2001 and 2002," says Curt McCasland, Cabeza Prieta's assistant refuge manager. "Nearly every one died. One female spent the last few days of her life right next to Highway 85"—a busy route through Organ Pipe Monument. "It had rained on the other side, but she wouldn't cross." If McCasland, refuge biologist Michael Coffeen, and others hadn't kept packing coolers of water into the wilderness for the staggering animals to find, perhaps none would have survived. The aid efforts didn't stop there. With support from private wildlife organizations, staff from the refuge and Arizona Game & Fish Department fenced a square mile of Cabeza Prieta range, added water, and brought in pronghorns from both Mexico and Arizona to breed in captivity.

Today, the U.S. population is back up to 60 plus, including 14 adults and their offspring in an enclosure. In the first light of day, Allen Zufelt of the game department climbs a nearby hill and locates the animals with a telescope, focusing on a doe with twin fawns, the buck that fathered the young, and other captives until he is satisfied that all are healthy. The next step in his daily routine is to walk the four-mile perimeter to be sure no openings have appeared in the woven wire fence or the electric fence in place around that. A double layer of security was called for to keep out coyotes, bobcats, and mountain lions and discourage illegal border-crossers from breaking through.

"We get thousands of undocumented aliens a year coming through the refuge and Organ Pipe," Zufelt tells me.

The people smugglers, labeled coyotes, and the drug smugglers, or *narcotraficantes*, have built up networks with lookouts, satellite phones, night-vision goggles, and modified high-speed vehicles that have cut tracks all through previously remote terrain. Some days, my naturalist treks have led me to more improvised shelters

and abandoned gear—not to mention Border Patrol squads and Black Hawk helicopters—than wildlife. It's like being in the midst of a guerrilla conflict.

Watching smoke rise from wildfires to the north, Zufelt calls it a sign of what some consider the most serious yet overlooked modern threat to the ecosystem: hardy grasses and weedy herbs from the Sahara and deserts in the Mediterranean and Asia. A few, like buffel grass, were introduced as livestock forage. Forming a ground cover dense enough to fuel roaring blazes in an ecosystem never subject to wildfire before, the invaders could eventually replace slower growing, woody plants—in other words, the very cactuses and small trees that define the Sonoran Desert.

Pronghorn mothers and fawns have joined in a nursery band just across the fence. The doe move away in an effortless trot when they catch our scent. We catch theirs as the white rump hairs puff out in warning, releasing an almondy aroma from special glands. Zufelt points to a Harris's hawk nest with young atop a saguaro. "A pair of foxes dug into the pen," he recalls. "Half a dozen pronghorn bunched up and started chasing the foxes. One fox busy looking over its shoulder at a doe ran near this saguaro and was whacked on the side by an adult hawk defending the nest. That fox must have been thinking, Man, I've got to get outta here."

Rain has once again refreshed the arroyo pools. Except for a Gila woodpecker in flight, nothing stirs on the sun-stunned mountainsides above. Yet rain did fall, and more is predicted. Mirages dance over the valley, making it seem that the green plants shimmering below are merely an illusion. And yet rain fell. It always will, sooner or later. And thousands of years of wild invention will come into play to extract the most from every drop. □

Visitor Alert A geotourism map with tips on Sonoran nature and culture is due early in 2007. See nationalgeographic.com/travel/sustainable.



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3. Ask your kids to send their entry form, photo, and essay, as described in the official contest rules, to Hands-On Explorer Challenge Contest, National Geographic Society, 1145 17th St. NW, Washington, DC 20036.

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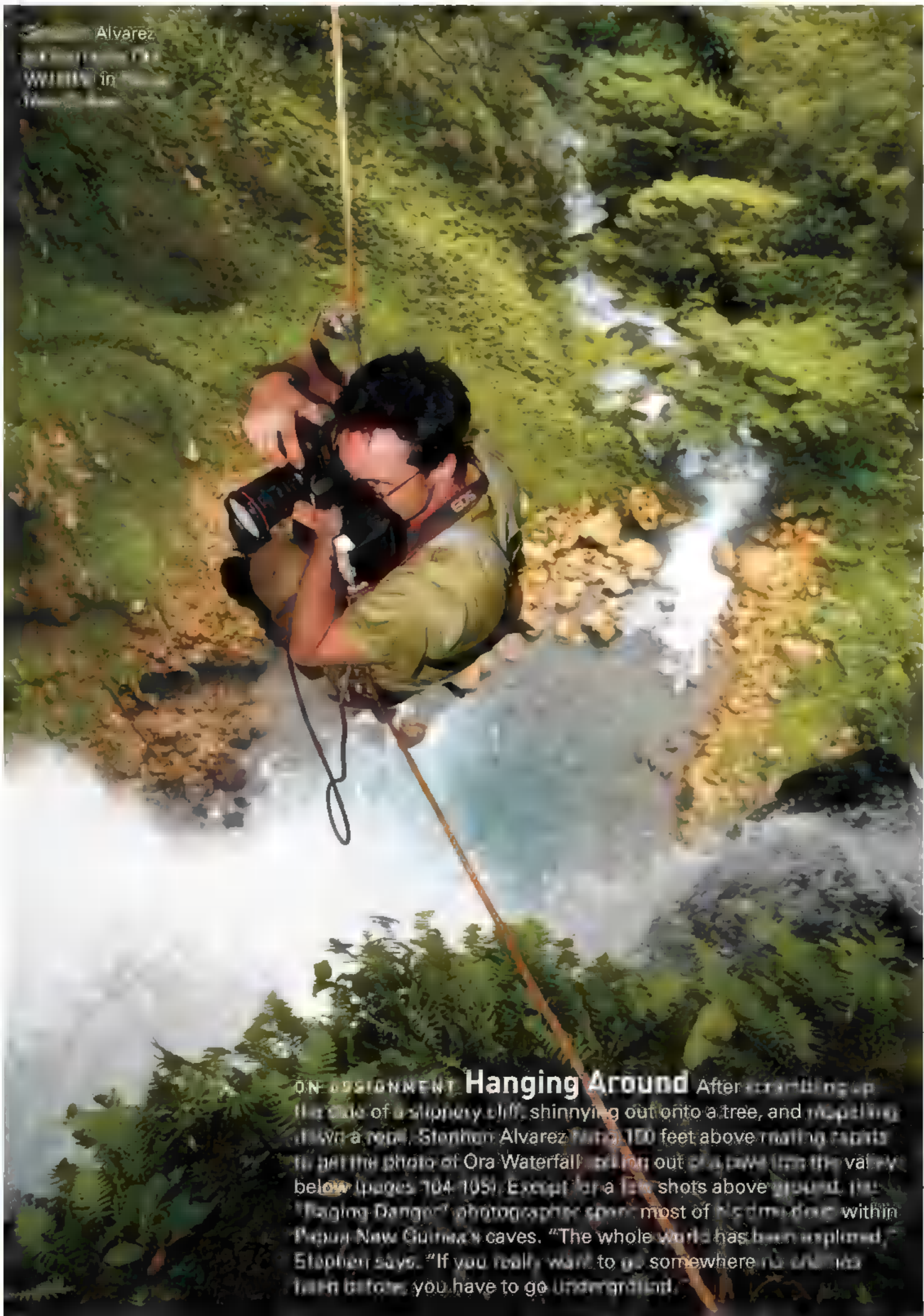
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Alvarez
 rappelling
 150 feet
 above
 ground

ON ASSIGNMENT **Hanging Around** After scrambling up the side of a slippery cliff, shinnying out onto a tree, and rappelling down a rope, Stephen Alvarez hangs 150 feet above nesting rapids to get the photo of Ora Waterfall peeling out of a cave from the valley below (pages 104-105). Except for a few shots above ground, the "Flagging Danger" photographer spends most of his time deep within Papua New Guinea's caves. "The whole world has been explored," Stephen says. "If you really want to go somewhere no one has been before, you have to go underground."

LEGAL NOTICE

IF YOU ARE AFRICAN AMERICAN, HISPANIC OR LATINO AND HAVE OR HAVE HAD AN ALLSTATE POLICY, A CLASS ACTION LAWSUIT MAY AFFECT YOUR RIGHTS

WHAT'S THIS ABOUT? A nationwide settlement has been proposed in a class action alleging that Allstate violated Federal Civil Rights laws in connection with its use of credit report information to price personal lines insurance policies, including auto and homeowners policies. Allstate denies it did anything wrong and the Court made no determination that Allstate did anything wrong.

The United States District Court for the Western District of Texas authorized this notice. Before any settlement benefits are provided, the Court will have a hearing on **December 18, 2006** to decide whether to approve the settlement. **This notice only summarizes the proposed settlement. The detailed notice, which includes the detailed language of the general release, and other court documents can be obtained by calling 1-866-817-6514, writing to DeHoyos Settlement, P.O. Box 9000 #6428, Merrick, NY 11566-9000 or by visiting www.creditusesettlement.com.**

ARE YOU AFFECTED? You are a Class Member affected by this Settlement if you:

1.) Are a Black/African American individual or an individual of Hispanic or Latino origin; and 2.) Were in the past or are currently an insured under an Allstate personal lines insurance policy, such as an auto or homeowners policy, and were charged more than the lowest available premium based in whole or in part on your credit report information; and/or 3.) Applied for an auto or homeowners insurance policy from one Allstate insurer, but were instead issued a policy by another Allstate insurer, based in whole or in part on your credit report information; and 4.) Received a notice with your new or renewal insurance policy that: (1) stated Allstate used credit information to underwrite, rate or price your policy, (2) explained that you did not qualify for lower rates or that you did not qualify for a policy based on your credit information; and (3) advised you of your rights under the Fair Credit Reporting Act.

WHAT DOES THE SETTLEMENT PROVIDE?

If the Settlement is approved, Allstate will:

1.) Implement a new insurance scoring formula. 2.) Provide information to Class Members who complete Request Forms explaining how to obtain a policy that is priced using this new insurance scoring formula. 3.) Make this new insurance scoring formula publicly available. 4.) Make a credit education program available designed to benefit Class Members. 5.) Implement an "appeals" program for customers to appeal insurance scores in extraordinary circumstances. 6.) Increase the percentage of its multicultural national media spend. 7.) Make one-time monetary payments to eligible Class Members who complete Request Forms.

A Request Form can be obtained by calling 1-866-817-6514, writing to DeHoyos Settlement, P.O. Box 9000 #6428, Merrick, NY 11566-9000 or by visiting www.creditusesettlement.com. Please do not call the Court.

WHAT WILL CLASS MEMBERS GIVE UP? Class Members agree that they release and forever discharge the Allstate Released Parties from liability for the Litigation in any state or federal court, in or before any regulatory body or administrative agency, or in any other proceeding regarding the Allstate Released Parties' use of credit reports, credit information, and/or insurance scores in any form and in any manner whatsoever to underwrite, price or rate insurance policies, including but not limited to any claims arising under 42 U.S.C. § 1981, 42 U.S.C. § 1982, and 42 U.S.C. § 3604, and any tort claims, contract claims, statutory claims, controversies, claims for disgorgement, claims for restitution, actions, causes of action, declaratory judgment actions, cross-claims, counterclaims, demands, debts, claims for damages, liquidated damages, punitive damages or exemplary damages, equitable relief, injunctive relief, costs, expenses and/or attorney's fees, or liabilities of any nature in both law or in equity, past and present, and whether known or unknown, suspected or claimed, regardless of whether each Class Member timely makes a claim for benefits under the Settlement.

WHO REPRESENTS CLASS MEMBERS?

The Court appointed the law firms of James, Hoyer, Newcomer & Smiljanich, P.A., Bonnett, Fairbourn, Friedman & Balint, P.C., and Lerach, Coughlin, Stoia, Geller, Rudman & Robbins LLP as Class Counsel to represent the Class Members. Class Members don't have to pay these lawyers anything to represent them. Any Class Member is free to hire his own lawyer to appear in Court at his own expense.

WHAT ARE CLASS MEMBERS' OTHER OPTIONS?

Class Members have the right to object to the Settlement and/or Class Counsel's motion for fees and costs. The objection deadline is **November 6, 2006**. The detailed notice explains how to object and includes specific requirements for objectors represented by counsel. You must comply with these requirements in order to have your objection considered. The Court will hold a hearing in this case on **December 18, 2006** to consider whether to approve the Settlement and a request by Class Counsel for \$11,720,000 in attorney's fees and costs for their work in this case and the payment of \$5,000 to each of the Class Representatives. If the Court approves the attorney's fees and costs, they will be paid by Allstate and not Class Members. You can obtain a copy of Plaintiffs' request for fees by calling **1-866-817-6514**. Class Members may ask to appear at the hearing, but are not required to appear. This is only a summary, for more information call **1-866-817-6514**, write to DeHoyos Settlement, P.O. Box 9000 #6428, Merrick, NY 11566-9000 or visit www.creditusesettlement.com. Please do not contact the Court.

A Time Line at Her Feet

Writer Cathy Newman has collected many shoes during assignments over the years. These are just a few.



BEHIND THE SCENES

Foot Notes

Her article may be titled "Every Shoe Tells a Story," but for Cathy Newman, every story has a shoe. While on assignment she's bought boots to protect her from snakes and rubber-toed waders to keep her dry. A story on dance prompted the purchase of tap shoes, and some suede lace-ups bought for a story on perfume "reminded me of orange blossoms," her favorite fragrance. Pointy chestnut Philippe Models, her most recent purchase, are beloved if a bit snug. Says Newman, "That's my career in a shoe closet."

September Contributors

Karen M. Kostyal traveled to Cairo to interview the popular Egyptian author—and practicing dentist—Alaa Al Aswany for "Voice of Reason" (page 32). She's a text editor for NATIONAL GEOGRAPHIC.

Brook Larmer wrote "Manchurian Mandate" (page 42). He is the former Shanghai bureau chief for *Newsweek* and author of *Operation Yao Ming*.

Fritz Hoffmann shot the story on Manchuria. The American photographer moved to China in 1995 to document social change. He makes his home in Shanghai.

Cathy Newman wrote "Every Shoe Tells a Story" (page 74). She is a senior writer on the magazine and says that on a good day she wears a size nine-and-a-half.

Mitchell Feinberg's images illustrate the shoe story. An American based in Paris, he has photographed everything from luxury watch ads to the band Daft Punk's latest album cover. This is his first assignment for NATIONAL GEOGRAPHIC.

Neil Shea is an experienced caver and climber but prefers to practice those activities in drier

places than the ones he described in "Raging Danger" (page 94). He is a staff writer.

Stephen L. Alvarez photographed the caves beneath the rain forest of Papua New Guinea's New Britain island. No stranger to the underground, Alvarez also documented an expedition to Krubera Cave, the world's deepest, for the May 2005 issue.

Dereck and Beverly Joubert collaborated on "Killer Pride" (page 110). He wrote the article; she made the photographs. The husband-and-wife explorers-in-residence are returning to Botswana to continue their study of lions.

Douglas H. Chadwick wrote "Songs of the Sonoran" (page 124). A biologist as well as an author, his latest book is *The Grandest of Lives: Eye to Eye With Whales*.

George Steinmetz, a longtime contributor to the GEOGRAPHIC, was the photographer for the Sonoran Desert article.

Tales From the Field Find more stories from our contributors, including their best, worst, and quirkiest experiences, in Features at ngm.com/0609.



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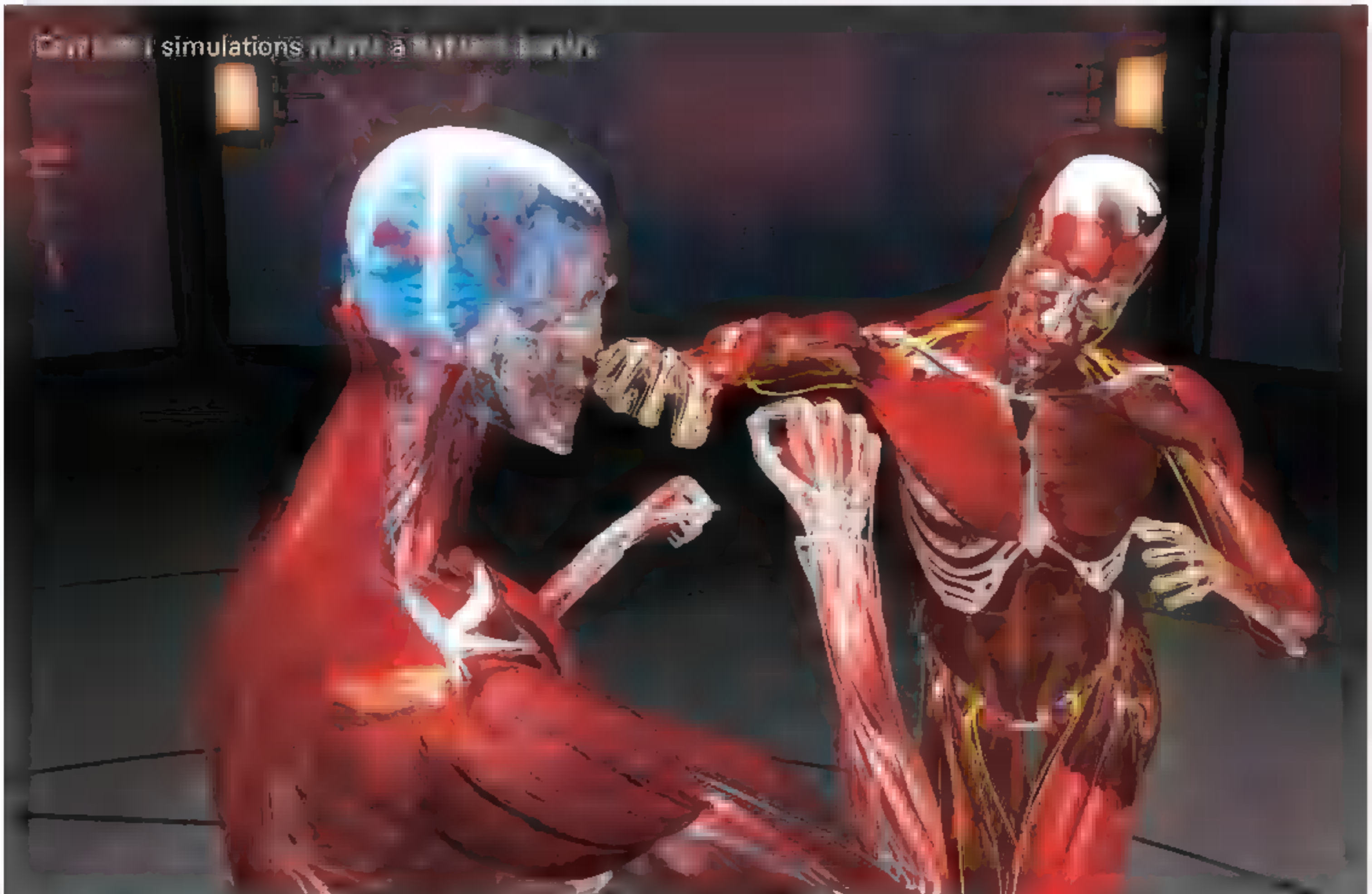


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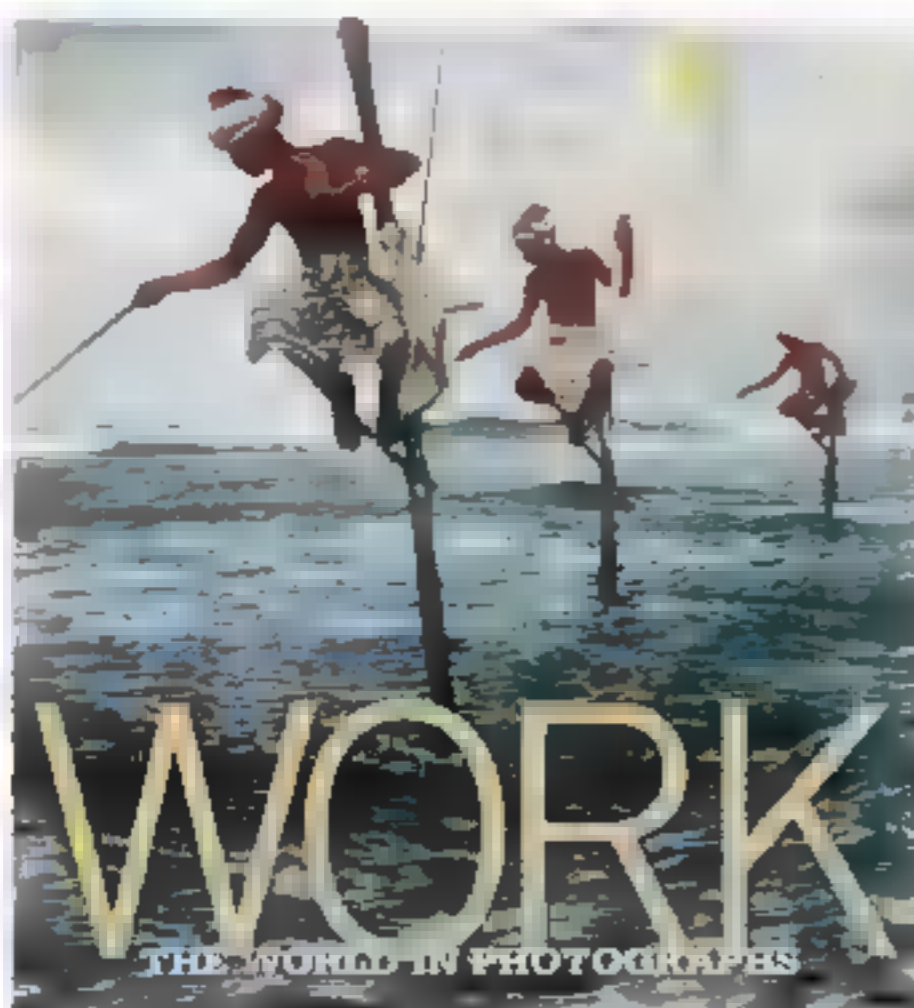
INSIDE GEOGRAPHIC



Fight Science Monday, September 4 at 9 p.m. ET/PT

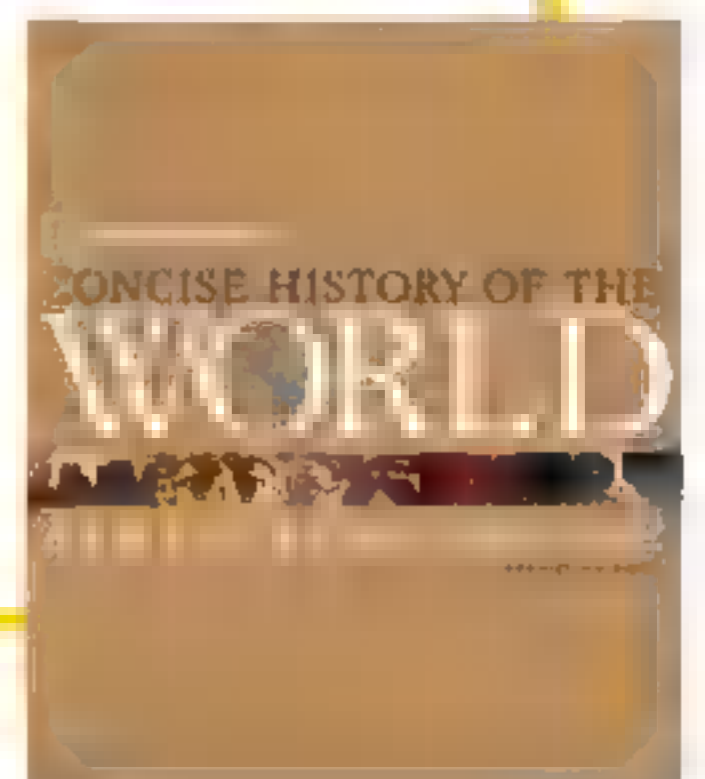
Can a ninja deliver a deadly punch? Is a samurai sword the ultimate weapon? National Geographic Channel worked with martial arts Hall of Famer James Lew to bring together fighters from disciplines including boxing, jujitsu, and wushu, then challenged them all to a fight. With scientists calculating speed, balance, and force, "we applied all of the pieces of technology," says executive producer Mickey Stern, "borrowing from crash-test dummies, NASA, biomechanics, Hollywood special effects, and joint replacements." This combination offered a new look at the human fighting form with computer simulations of bones, muscles, and nerves measured in real time. The findings surprised even the scientists.

NG Books



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Sole Survivors The cruel shoes of a Hindu fire walker in Durban, South Africa, were meant to prove the wearer's piety. "Indian mystics will tell you that by self-inflicted tortures the soul reaches through flesh-numbing ecstasy toward those higher states of being that lie between it and the Absolute," wrote Melville Chater in "Under the South African Union" in the April 1931 *GEOGRAPHIC*. The nail-spiked sandals may also have helped toughen the feet of the fire walkers, who ran through a bed of embers so hot that the "spectators must shelter their faces from it." Noted Chater: "Indisputably the foot soles of two of the [fire walkers], as they lay in collapse after the ceremony, showed ash dust, but no burns." —Margaret G. Zackowitz

Flashback Archive All the photos plus e-greetings, in Fun Stuff at ngm.com/0609.

PHOTO: LYNN ACUTT

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